HM

January 1953

UNIVERSITY
OF MICHIGAN
JAN 22 1953
PERIODICAL
READING ROOM

THE VOLTA REVIEW

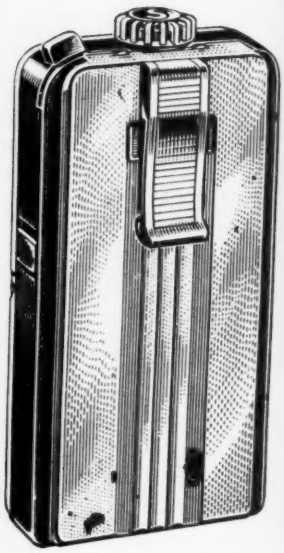
Founded in 1899 by Alexander Graham Bell

For those with mild hearing loss, the new "988" the midget miracle, the world's *thinnest* hearing aid.

Help others to hear!

There is a SONOTONE specially designed for almost every degree of deafness.

The "977" for those with average hearing loss. Automatically chokes off loud, uncomfortable noises.



The "966" for many of those who never expected to hear again. Has *six* tubes instead of *three*, gives *ten* times the power of the ordinary hearing aid.

WHAT A DIFFERENCE A HEARING AID MAKES TO THE HARD OF HEARING!

Share your knowledge. Help those who are hard of hearing by encouraging them to buy —and use—a SONOTONE. When you recommend a SONOTONE you have SONOTONE'S assurance that you will be backed with the utmost in good service.

The hearing aid—selected with the advice of the SONOTONE Consultant—will be the one best fitted for your individual pattern of loss, as shown by audiometric testing. SONOTONE'S offices—more than 400 of them in this country—are ready to offer prompt, uninterrupted service to SONOTONE wearers.

Sonotone products are on the list of A.M.A. Council accepted devices.

ACCEPTED COUNCIL ON PHYSICAL MEDICINE and REHABILITATION AMERICAN MEDICAL ASSOCIATION

Sonotone Corporation

ELMSFORD, N. Y.

The Volta Review is published monthly, except July and August, by the Volta Bureau. 35c a copy $3.00 a year. In Canada and the other Americas, $3.25. Foreign, $3.50.
Entered as second class matter at the post office at Baltimore, Md., under Act of August 2, 1912.
Accepted for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917 authorized January 22, 1932.
Publication Office: Monumental Printing Company, 32nd Street and Elm Avenue, Baltimore 11, Md.
Editorial Office: 1537 35th Street, N. W., Washington 7, D. C.

CONTENTS, JANUARY 1953

Kaleidoscopic English, and a Lipreader 11
Catherine A. Hood

The Otologist and the Deaf Child 15
Louis Kleinfeld, M.D., F.A.C.S., F.I.C.S

Opportunities in the Hearing and Speech Field 17

Speech and Speech Perception, *a panel discussion* 20
Clarence V. Hudgins, Marjorie E. Magner, Gordon E. Peterson, Marian Quick, Louise Hopkins
The fourth installment of proceedings of the Summer Meeting of the Volta Speech Association for the Deaf, June 1952

Molly Mather's Mailbox 39

I Am One of the Lucky Ones 41
Patricia Stewart

In the Books and Magazines 43

Our Miscellany 44
Notes from the Summer Meeting; Harris Taylor Memorial; Gifts for Volta Bureau Service; "Ewing House" in Australia; The Volta Review Is Appreciated; The Hard Way of the Transgressor; Summer Farm Opportunity

Kernels 60

Volts 62
Compiled by John A. Ferrall

Want Ads 62

Cover: **A little pupil in the Dominican School for the Deaf, Cabra, Dublin, Ireland, lipreads her father's conversation. A photograph from the Irish News Agency.**

Only one contributor this month needs an introduction to VOLTA REVIEW readers. She is the "lucky" *Patricia Stewart*. Mrs. Stewart is News Editor of the Baker (Oregon) *Democrat-Herald*, and we hope she will come again.

AT LAST!

Volume I of Edith M. Buell's

OUTLINE OF LANGUAGE FOR DEAF CHILDREN

With Notes on the Presentation of the Work of the 1st, 2nd, 3rd and 4th Years

IS AGAIN AVAILABLE

This book, a classic in its field since its first publication in 1929, needs no introduction to teachers of the deaf.

Order your copies now from:

THE VOLTA BUREAU
1537 35th St., N. W.
Washington 7, D. C.

At $2.50 a copy, plus 12c for mailing

Volume II, with some new material, will be available in 1953.

How to enjoy better Telephone Reception

Your telephone may be provided with an amplifier that makes telephone voices sound louder. At the turn of a button, people with impaired hearing may get low, medium or high amplification to better enjoy the convenience of telephone service. We suggest you arrange for a trial of this equipment at the nearest Business Office of your Bell Telephone Company.

By courtesy of the National Geographic Society

ALONG THE WESTERN MAIN ROAD OUT OF PORT-OF-SPAIN, TRINIDAD, THERE ARE FISHING VILLAGES. THE MEN GO OUT IN THE EARLY MORNING AND RETURN LATER IN THE FORENOON TO DRY AND REPAIR THE NETS.

The Volta Review

Copyright, 1953, by the Volta Bureau, Washington 7, D. C.

Vol. 55, No. 1 | Educational Press Association of America | January 1953

KALEIDOSCOPIC ENGLISH, AND A LIPREADER

By CATHERINE A. HOOD

AN attendant at Idlewild International Airport opened the last of several doors and there, out in the December night, stood the silver airliner that was to carry me over the ocean and all night long and into the next day, until I arrived at Trinidad. Behind me were sixteen years of rising above a doctor's verdict that I would never be any better than I was when, following an attack of spinal meningitis, I lay flat on my back in a hospital bed, completely helpless.

Ahead of me was unknown adventure. I was standing on my own two feet, a picture of health, and I am sure that later, when I left my seat at dawn to discard my heavy coat and my fellow passengers saw me walking in the plane unassisted, they little suspected that I use crutches some of the time and am totally deaf. I myself little suspected that when I arrived in Trinidad my lipreading would be the focal point of interest.

My cousins' house in San Fernando overlooks the Gulf of Paria, where Sir Walter Raleigh once anchored his ships. From it, on clear days, I could see the mountains of the Andes Range in Venezuela. I could also see Pitch Lake across the Gulf, and one day had the intriguing experience of standing on this "lake" and feeling the asphalt coming up out of the earth under my feet, like a road making itself—just as it did when Sir Walter discovered its wealth and used the natural asphalt to calk his boats.

Another day I stood on a mountain on the northern coast of Trinidad and looked across the Caribbean Sea to the Island of Tobago that is said to be the setting for the story of Robinson Crusoe. Nearly every day I saw sugar cane, first in blossom, then being cut, and finally going through a factory until it came out warm brown sugar which I was allowed to sample.

I saw cocoa plantations, with the pods of yellow, green, and red on the trees and then in piles on the ground, and still later the beans from them being "sweated" in sheds, then dried out; and finally I held in my hand a crude ball of chocolate the natives made from the beans.

I saw rice fields and cotton; colorful tropical flowers, birds, and butterflies; picturesque thatched-roof mud huts; and the fields and roads teeming with East Indian and black African laborers.

All these things I had known about beforehand, but I had been entirely unprepared for (and was completely nonplussed by) the cosmopolitan Trinidadian speech with its great variety of accents and terms.

Of course the speech of the people from various parts of the United States differs and we meet "foreign" accents right here, but we are not usually surrounded by accents all foreign to us and all different!

Trinidad is a port of call for ships and planes from all over the globe, and is said to have a population made up of the greatest mixture of races and nationalities of any place of like area in the entire world. Nearly everyone speaks English, but not as Americans to whom I am accustomed do! The Trinidad speech is more like that of the British whom I have encountered only occasionally, plus an incredible variety of individual accents.

If I had lived longer among British people, I might not have felt so stupid as I did one evening when a woman was telling me about her brother in Canada who, like me, is totally deaf as a result of meningitis. She said he was working in a .....

What he was working in, I had no idea. She repeated several times, until my hostess suggested gently, "Perhaps you say it ....." and she pronounced the word as I do and I understood it. The woman was saying her brother worked in a laboratory, but she pronounced it *luhBAWruhtree*, her British pronunciation being far removed from my Yankee *LABruhtawree*.

Accents of All Flavors

My cousins, Grace and Frank Kemp, are Canadians with mixed accents. Frank was born in a Scotch settlement in Cape Breton, Nova Scotia. He grew up speaking Gaelic as well as English, and his Scotch accent was given strength when he took his Ph.D. work at Edinburgh University in Scotland. Added to this, he speaks Hindi, this tongue-and-tooth Indian language and the gutteral Gaelic having their separate effects on his Scotch-Canadian speech.

Grace Kemp was born in Iowa but went to Manitoba when she was five, where she lived until she graduated from college and went to Trinidad to teach. She also speaks Hindi, and has added to her Iowan-Canadian pronunciations some Trinidadian accents, making her speech unique.

The Kemps are members of a group of Canadians sent down to Trinidad by the United Church of Canada to educate the East Indians. Their Mission was founded nearly one hundred years ago when a clergyman from Nova Scotia, there for his health, discovered that the East Indian laborers on the sugar estates, who were being brought to the island at the rate of from one to five thousand a year, were having nothing done for their intellectual and spiritual needs. The race prejudice which largely brought about this neglect was very different from the type familiar in this country. It was between the East Indians and the African blacks whom the Spanish had brought in as slaves over a period of two hundred years, until the British took possession of the island and in 1834 freed them. Neither Indian nor black approved of the other's customs and religions. There were Government and Roman Catholic schools, but until the Canadians came the barrier of language, as well as religious and living habits, had kept the East Indians from all of them.

To read about all this helped me understand the life around me, but it did not help me understand the speech.

Frank Kemp is manager of more than a third of the Mission's 70 schools, and of 120 churches. When I arrived in December the schools were closing for holidays and a steady stream of headmasters, teachers, students, and preachers were coming to the house with annual reports and problems, so I met many East Indians at once. Their friendliness was charming. And I could not have been set down among a nicer group of people anywhere in the world than the Canadians who ran the Mission's colleges, churches, and other institutions. They were friendly, invited me into their homes and talked to me, and it was often embarrassing when I could not understand conversations.

Even Maps Helped Very Little

I studied history, maps, and newspapers, hoping that meeting in print the names of places and people and the modes of speech would make them less strange to me when I met them on the lips. But how could it, when I visited in St. Augustine only to find they pronounced it *awGUStin* (not *AW-guhsteen*), and met the manager of the Caroni Sugar Estate which I learned was not *CaROnee* as I read it on the map but *CaruhNEE* when he said it!

I frequently became dizzy from attempting adjustment to first one accent and then another. My East Indian host at tea one day expressed it well (if optimistically) when he said, "You will be an international lipreader by the time you leave Trinidad."

He, a lawyer, was born in Trinidad. His speech was colored by the effects of having spoken the native Hindi all his life and of his having been educated in England and in America. His wife, a former Brahmin priestess, is more at home in Hindi than in English. His young nieces talk in the quick British known as Trinidadian.

I also met at tea Chinese and Portuguese guests whose families had been in Trinidad for several generations; a priest who had come from Ireland a week earlier, and one who had come from Italy six months earlier; a Spanish woman who had been born in Caracas; a group of Scotch-Canadians; and several East Indians.

My host that day was intrigued by the

NOW A CHRISTIAN, BUT FORMERLY A BRAHMIN PRIESTESS, SHE IS MORE AT HOME IN HINDI THAN IN ENGLISH

differences in his guests' ways of speaking, and how these were high-lighted by the presence of a lipreader. But all the people I met in Trinidad were interested in the manner in which their accents added another dimension to their speech when confronted by a lipreader, and we talked about it freely from the start.

The Kemps helped me with the proper names that are hard for lipreaders any time, but worse when they are Indian family names, Mulchansingh, Teelucksingh, Ramkeesoon, Ramrekha, Radhakissoon, Boodoosingh, Moosai-Maharaj, or simply Maharaj (mah-rahj).

Frank also helped me with the name of the church I went to, *Susamachar*. I remembered the name more easily for having his explanation that *su* means 'glad' or 'good' and *samachar* means 'news' or 'tidings.' It is the Church of Glad Tidings, you see, and is pronounced *soosuh-muhSHAHR*.

How I read lips interested people there so much that they asked me to talk about it on several occasions. One morning I talked at the Teachers' Training College, and there was a question period afterwards. A student's question illustrated nicely what I had been telling them about the need for working harder with my imagination in the face of terms that were new to me. I could not understand his question at once, and when the principal said it for me and I got it instantly the students laughed appreciatively. My interpreter, a Canadian, was familiar with American terminology. He had recognized the trouble at once and quickly rescued me with, "Do you go to the movies?" The student had said, "Do you attend the cinema?"

A guest at the Canadian Women's Club meeting where I spoke illustrated what I had told them about pronunciations when she prefaced a question with, "I want to ask you ....." she said a beautiful round *ahsk* that I wished I could have heard. I pointed this out, saying it was different from my flat *ask* or even from the way a Canadian would say it. I was rewarded by her admission that she was Dutch.

This Hollander and several other women at the meetings were wives of engineers and technicians in Trinidad's huge oil industry. Many had come from various parts of Canada, with accents to suit their localities; and besides Holland, others were from England, Scotland, Persia, British Guiana, the Bahamas, Jamaica, and the United States.

One woman had light brown skin and it seemed to me there was something

WITH TILLIA "HUSSEFF" ON ONE SIDE, HER FRIEND "MISS CATRIN" FINDS A SECOND CRUTCH QUITE UNNECESSARY.

French about her—her looks and the way she used her hands. During the social hour I learned that her mother (white) was born in Scotland and her father (Negro) in Barbados where they met and married, then went to Canada and lived in a settlement of French-Canadians. She is married to an East Indian doctor whom she met when he was studying in Canada, and cheerfully admits she is "all mixed up."

Creoles, or "mixed" colored people on the island, are not always so delighted with their combinations of race, and they often lower their heads and mumble so that their talk is hard to understand. This woman was charming and spoke easily and unselfconsciously, and I understood her perfectly.

Tillia Was Not Too Difficult

I also understood the Kemps' African cook, Tillia. This was partly because she, an intelligent woman, made special effort to speak distinctly for me, but also because she talked somewhat like our United States southern Negroes, though she was of the third generation of her family in Trinidad and sometimes spoke the patois that had come down in her family from her great-great-grandmother who was born on the island of Martinique.

Tillia liked to show me the fruits from the Kemps' trees or the vegetables she brought home from the market, that I had not seen before. Her own and her "Mistress Kemp's" patience knew no bounds in giving me the names, though Tillia's limited education led to Grace's rescuing me sometimes when I could not understand a new word on Tillia's lips and she was afraid I couldn't interpret her spelling—like the time she tried to write *sapodilla*.

Try This on Your Mirror

If you should stand before a mirror and say, or get someone to say for you, "Cush-cush," could you get it without hearing? *Cush-cush* is a white yam, and I never could understand when anyone said it to me early in my visit.

I got the word *plantain*, but did not believe I had when I was served it. In the tropics it is not a green enemy in the lawn, but a cooked yellow vegetable that looks like a quartered boiled banana.

I discovered how differently Indians and Negroes talk when I spent five days at the home of East Indian friends, and on my return to the Kemp household I could not immediately understand a word Tillia said.

It would be impossible to describe all the fascinating differences I had such a good time noticing in Trinidadian speech, or to adequately express what a wonderful experience I had—which deafness aided more than it hindered.

The Wonders Linger

I shall never lose the wonder of the trip itself and that I, whom doctors once consigned to bedridden invalidism, accomplished such a journey. Or the joy of living for four months at the Kemps' home on Paradise Hill, with the water of the Gulf of Paria continually performing its magic of changes in greens and blues, with purple patches that were cloud shadows. Nor the bliss of tropical heat and beauties during the winter months that were bleak and cold back home. I can still see in my mind the plantations of coconut palms along the beaches with the surf rolling up the sand to the bases of their trunks, and feel the sun-warmed spray as it blew off the ocean on the eastern and southern coasts of Trinidad.

Much Communication Was Wordless

With so many wonders to see and feel, it was interesting but not too important that I had difficulty with multiple accents. There are other ways of communicating besides vocal. I shall never forget the communicated goodness of my Canadian cousins and their associates, which their actions conveyed to me perhaps better than their speech would have could I have heard it; nor that of the East Indians who talked to me through their unfailing courtesy; nor that of Tillia whose simple generous warmth was typical of those of her race whom I met there.

In Trinidad, a colloquial expression for "I like him very much," is, "I like him too bad." And "I feel to eat," for "I am hungry," or similarly, "I feel to go," "I feel to sleep," and so on.

I left Trinidad liking the people there "too bad"; and for the wonderful time they all helped me have, I "feel to" thank God.

THE OTOLOGIST AND THE DEAF CHILD

By Louis Kleinfeld, M.D., F.A.C.S., F.I.C.S.

TWO questions that an otologist hears only too often are: "Is my baby deaf?" and, if the answer is in the affirmative, "What shall I do now?" Neither of these questions can be given a simple answer.

Accurate testing of the hearing of a very young child is difficult, and until recently was considered almost impossible before the age of three or four. Now physicians and scientists have access to various methods of testing which, although not invariably accurate, do help in determining hearing loss and its degree.

In the absence, in many places, of equipment for testing young children, we can still gain clues by closely watching the child's reactions—particularly eye movements—in response to sounds. This requires a good deal of common sense, patient observation, and often repetition of the examination. An apparent reaction to a sound may be only a response to associated movements or vibrations which can be seen or felt. In case of doubt, there is an ice water test which will give a clue as to the status of the auditory nerve. Later on, x-ray studies might offer value.

In this connection, Froeschels makes an interesting suggestion. Feeling that even a young infant normally responds to hearing tests, he advises routine testing of hearing of all infants at intervals. If a hearing loss is then noticed in the first one or two years, it can be definitely classified as either congenital or acquired, because we will know whether or not hearing had been present in early infancy. Otherwise, this important differential diagnosis will rest on the history of the onset as given by the parent, a notoriously unreliable criterion.

It would be very worthwhile to get, whenever possible, a detailed history from the obstetrician, of any illness in the mother occurring during the pregnancy, with especial reference to virus infections such as rubella (German measles) and to Rh factor disturbances. This should be done not only for scientific reasons, but because so many mothers are showing a tendency to claim later on that they had German measles during pregnancy. The number of such mothers seems to be increasing beyond all probable figures.

The tendency of the mother to convince herself that she had, while pregnant, some condition resembling German measles, is easy to understand from the psychological point of view. These parents often seem to show a peculiar sense of guilt. Naturally, deafness in a child which resulted from a contagious illness contracted by the mother would diminish this feeling. In addition, it would relieve the parent of the crushing burden of knowing that heredity might play a disastrous role in future generations.

Once the physician has decided that a fairly marked impairment of hearing exists, the question of what to do with the young child comes to the fore. At this point, we have found it advisable to warn the parent against useless treatment. These parents show an exaggerated tendency to shop around for help and comfort. In doing so, they often waste time and money on useless and sometimes even harmful procedures. They should be specifically advised against osteopathic or chiropractic manipulations, against useless surgery, and against further consultations or local treatments, except for occasional office visits and tests at long intervals, to supervise progress and to have hearing tested. The indications for surgery or medical treatment in these children are exactly the same, no more and no less, as for normal children.

Almost invariably, at this point in the interview, the question of the fenestration (window) operation is brought up. The otologist explains that this brilliant operation is unfortunately not suitable for the type of hearing loss usually found in children. Often, too, parents inquire about radium treatments, and the doctor must explain that the need for radiotherapy is no different than it is in a normal child. The only question is, "Is lymphoid tissue present and is it causing any symptoms?"

The otologist is now ready to come to the constructive part of the interview. He should not only assure the anxious mother

that the child can be made into a useful, happy and socially acceptable citizen, but he should also explain that there is no organic bar to the child's future acquisition of adequate speech. This prognosis, however, can be assured only if the youngster is given the skillful and detailed pedagogic training required. Within the past few years, the necessity of commencing the child's education at the earliest possible age has become almost universally accepted. The mother should be told that even from infancy the child should be treated, in every way possible, exactly as a hearing child. He should be talked to, encouraged in speechreading, and given auditory training and training for his sense of touch. At no expense the parent may get detailed suggestions from (1) the Volta Review, 1537 35th Street, N.W., Washington 7, D. C. and (2) The John Tracy Clinic, 806 West Adams Boulevard, Los Angeles 7, California.

At the earliest possible age, usually around three, the severely deafened child should be admitted to a first-class nursery school for the deaf. In such a school, in addition to careful observation which will ultimately demonstrate more accurately the amount and kind of hearing loss, the child is given pedagogic training, often utilizing group or individual hearing aids. As a result, the child will be ready to enter a school for the deaf at the same scholastic level as any normal hearing child of the same age would be. It is the duty of the otologist to have on hand a list of the best schools for the deaf in his locality.

A discussion of the procedures for admitting a deaf child to one of the schools and the program offered, undoubtedly will be of value as a source of reference. I am submitting the one followed at the Lexington School for the Deaf, since it is the one best known to me, and is, I believe, fairly representative.

Any child of normal intelligence between three and twenty-one whose hearing loss is so great that he is having difficulty with his speech development, or cannot make progress in regular school, is eligible for admission to this special school. If the parents have been residents of the State of New York for one year, there is no tuition charge.

In taking steps for the admission of their child to the school, the interested parents arrange an appointment with the social worker for a preliminary conference. They bring the deaf child to the school, where he is observed by the educational directors and is given a hearing test and a psychological test. If, as a result of the preliminary conference, the child seems to be eligible for admission, a detailed written application is completed by the parents, and the date is set for admission. This application is submitted to the State Department of Education for approval of an appointment as a State pupil.

Generally, on the day the pupil is to be admitted, or in some cases prior to the day of admission, the child is given a complete physical examination by the physician in charge, who is a pediatrician. After this general physical examination, the child is admitted to class. Within a short time after his admission, the child is given a complete examination by the otologist and the ophthalmologist.

Because of distance from the school, some children have to be resident at the school from Monday to Friday. If the distance from the school is not too great, the child may be a day pupil. If he is resident, he is provided with board, room, and tuition without charge.

In the past ten or fifteen years, the benefits which accrue to children because of their early admission to schools for the deaf have been clearly demonstrated. In prior years, those deaf children who remained at home until the age of 5, 6, or even 7 and 8 often developed undesirable patterns of behavior due to inability of parents to cope with problems of deafness. Nursery school programs have helped to obviate this undesirable social problem. Admitting children at the age of 3 or younger gives impetus to the important program of speech and lipreading development with attendant language growth, and gives the child the opportunity of developing far better speech, voice quality, and general language ability.

The program of the school, in addition to specialized attention to speech, lipreading and the use of residual hearing, covers all academic subjects through junior high school. An extensive program of vocational training is also offered, leading the chil-

(See "Otologist," page 56)

OPPORTUNITIES IN THE HEARING AND SPEECH FIELD

THE following list of scholarships, fellowships, and assistantships relates to teacher-training opportunities in the field of hearing and speech for the academic year 1953-54.* It is in addition to the many general scholarships, both undergraduate and graduate, offered by most colleges and universities. The institutions and organizations granting the aids are listed alphabetically by states and cities.

ALABAMA

University of Alabama. Clinical Assistantships in Speech and Hearing Clinic: half-time; 20 hours per week of clinical assistance; $1,000 for regular school year; waiver of out-of-state tuition; students may enroll for three-fourths normal graduate load.

Technical Assistantships in Hearing Clinic and Recording Laboratory: part-time; hours ranging from 5 to 20 hours per week in speech laboratory with salary determined by type and amount of work; appointment up to $1,000 plus waiver of out-of-state tuition.

Start February or September. Address T. Earle Johnson, Head, Department of Speech, Box 2025, University, Alabama.

CALIFORNIA

Congress of Parents and Teachers. Scholarships: $150-$1200, depending upon circumstances. Address California Congress of P.T.A's., Occidental Life Bldg., 1151 South Broadway, Los Angeles 15.

Case-Miller Memorial Fund. Scholarships, administered by Hearing Center of Metropolitan Los Angeles: for experienced teachers who wish to take special training to fulfill the California State Board of Education requirements to teach hard of hearing children, and who expect to work in Los Angeles County; amount to cover the cost of tuition in approved course. Address Hearing Center of Metropolitan Los Angeles, 215 West 5th Street, Los Angeles 13.

Stanford University. Senior Clinical Assistantship, granted by the Junior League of San Francisco, Inc.: $1500 for approximately 20 hours per week; duties largely supervisory; M.A. degree and experience in clinical or remedial speech work required.

Clinical Assistantships, granted by the Junior League of San Francisco, Inc.: $660 each for approximately 10 hours per week of clinical work in speech and/or hearing; A.B. degree in speech correction, or equivalent training, and clinical experience required.

Clinical Assistantship: $900 for approximately 15 hours per week of clinical work primarily with adults; limited to students with some experience who expect to become candidates for the Ph.D. degree.

Scholarship or Fellowship: approximately full tuition for one student preparing professionally in the field of audiology; no duties involved.

(Assistantships do not carry remission of tuition, but a graduate assistant may carry a partial program of courses at reduced tuition rates.)

Address Virgil A. Anderson, Ph.D., Director, Speech and Hearing Clinic, Stanford University, Stanford, California.

FLORIDA

Tampa Hearing Society. Scholarship: $100; limited to teachers who wish to take training to teach the deaf and hard of hearing. Address Miss Mary Newkirk, 2904 Ola Avenue, Tampa.

GEORGIA

Emory University and the Junior League School for Speech Correction, Inc. Full tuition grants: to qualified graduate teacher-trainees in speech and hearing. Address Education Committee, Junior League School for Speech Correction, 1430 West Peachtree Street, N.W., Atlanta.

ILLINOIS

Northwestern University. Assistantships: duties up to 12 hours per week; demonstration teaching in lipreading, auditory training, etc., or auditory testing in adult hearing clinic, or participation in testing and teaching program of Children's Hearing Clinic, or audiological research; stipends up to $1150 for academic year and proportional stipends in summer session. Address Prof. Raymond Carhart, School of Speech, Northwestern University, Evanston.

*Every effort has been made to insure accuracy; corrections will be welcomed.

Audiology Foundation. Scholarships: $500 per year; applicants must be recommended by students' educational sponsors. Address Audiology Foundation, Box 21, Glenview.

Illinois State Normal University. Two Scholarships, supported by Illinois Congress of Parents and Teachers: $250 each. Address Division of Special Education, Illinois State Normal University, Normal.

Bradley University. Assistantships. Address Speech Department, Bradley University, Peoria 5.

Rockford College. Graduate Scholarship: $350, tuition only. Clinical Assistantship: $750 for graduate student in Speech and Hearing Clinic. Address Speech Clinic, Rockford College, Rockford.

INDIANA

Ball State Teachers College. One scholarship in Speech and Hearing Therapy, given by Psi Iota Xi: $100. Twenty scholarships for summer sessions, given by Indiana Society for Crippled Children: $50 each; applicants must be graduate students, or have taught, or be nurses. Address Dr. Alan Huckleberry, Ball State Teachers College, Muncie.

Purdue University. Graduate assistantships ("in-service" appointments involving ¼- or ½-time departmental duties, with free tuition and stipend of $750 or $1500): teaching assistantships; clinical assistantships in Speech Clinic; research assistantships in Voice Science Laboratory. Graduate Research Fellowships: for advanced full-time study with stipend of $100 a month and free tuition. University Fellowships: for beginning graduate study with $500 a year stipend, free tuition, and five hours duty per week. Address Dr. M. D. Steer, Director, Speech and Hearing Clinic, Purdue University, West Lafayette.

KANSAS

University of Kansas Medical Center. Room and board scholarship: carries with it responsibility of recreational supervision at Kansas School for the Deaf a few hours each week. Apply Miss June Miller, Educational Director, Hearing and Speech Department, 39th and Rainbow Blvd., Kansas City 3.

University of Wichita. Graduate scholarships, awarded by Institute of Logopedics: stipends vary from $50 to $250 per month; service scholarships, duties primarily clinical. Address Martin F. Palmer, Sc.D., Director, Institute of Logopedics, 2400 Jardine Drive, Wichita 14.

IOWA

State University. Audiology fellowships: carry stipends of $100 a month; require 20 hours per week on research project; permit 12 semester hours of study. Graduate scholarships and fellowships: carry stipend of $30 per month. Research and teaching assistantships: carry stipends of $80 to $100 a month. All cover tuition fees. Address Dr. Wendell Johnson, Director, Speech Clinic, State University of Iowa, Iowa City.

MICHIGAN

Wayne University. Six graduate assistantships: stipend $1,000 for 10 months. Several fellowships for doctoral applicants. Address Dr. George Kopp, Director, Speech and Hearing Clinic, Wayne University, 702 Putnam, Detroit.

Unlimited number of assistantships, and a number of scholarships for non-resident students in summer session available through Department of Special Education, College of Education, Wayne University.

Scholarships, administered through Wayne University, supported by Michigan Society for Crippled Children and Disabled Adults: up to $250 per year; restricted to those having at least 2 years of college, who will teach in the special field in Michigan at least two years immediately after preparation completed. Address Wayne University, 4841 Cass Avenue, Detroit 1.

Constance Brown Society for Better Hearing. Scholarships: for teachers in Kalamazoo schools; $40 for tuition at accredited college or university summer course. Address Constance Brown Society for Better Hearing, 210 Pratt Bldg., Kalamazoo.

Lansing Society for Better Hearing. Scholarship: $75; for prospective teacher of deaf and hard of hearing. Address Miss Pearl Turner, 214½ N. Washington Ave., Lansing 7.

MINNESOTA

University of Minnesota. Clinical and Research Assistantships in Audiology Labo-

ratory, University Hospitals: half-time; 20 hours per week; $1200 for eleven months; student expected to enroll for ⅔ normal graduate load. Address Dr. Frank M. Lassman, Department of Otolaryngology, E537 University Hospitals, University of Minnesota, Minneapolis.

MISSISSIPPI

Mississippi Southern College. Teaching Fellowships: $500 for school year. Working Fellowships: $375 for school year. Address Dr. W. H. Sumrall, Dean, Graduate School of Education, Mississippi Southern College, Hattiesburg.

NEBRASKA

University of Nebraska. Assistantships: up to $600 for academic year and up to $150 for four-week summer session. Address John Wiley, Director, Speech and Hearing Laboratories, University of Nebraska, Lincoln 8.

NEW YORK

Queens College. Scholarships and assistantships: for seniors and graduate students. Address Jon Eisenson, Queens College, Flushing, New York.

Teachers College, Columbia University. Ten scholarships for training prospective teachers of the deaf, offered by the Lexington School for the Deaf; each with value of $1200, providing board, room and laundry at the School and $200 in cash; lead to Lexington School certificate and M.A. degree from Teachers College. Non-interest-bearing loans from Harris Taylor Teacher Training Loan Fund also available for deserving students. Address Dr. Clarence D. O'Connor, Supt., Lexington School for the Deaf, 904 Lexington Avenue, New York 21.

Syracuse. Four assistantships in Hearing and Speech Center: remission of six hours course work permitted. Address Dr. Louis M. DiCarlo, Director, Hearing and Speech Center, Syracuse University, 817 University Avenue, Syracuse.

NORTH DAKOTA

State Teachers College. Scholarships, given by Minot Rotary Club: $100 for a Junior and $100 for a Senior in Speech Correction work; to be repaid if student does not teach in North Dakota.

Scholarships and fellowships administered by North Dakota Society for Crippled Children and Adults: $100 per summer term to $150 per semester; require 2 years' teaching experience; to be repaid if students do not teach in North Dakota.

OHIO

Western Reserve University. Research Assistantship: at Cleveland Hearing and Speech Center; starting September 21, 1953; half-time; 20 hours per week; $800 for nine months; remission of 9 hours (maximum load) per semester.

Graduate Scholarships: for training in speech and hearing therapy at Cleveland Hearing and Speech Center; remission of full tuition for academic year ($600); superior academic record required.

For both above, apply at once for academic year 1953-54 to Director of Admissions, Western Reserve University, 11105 Euclid Ave., Cleveland 6.

Teaching Assistantships, granted by Cleveland Hearing and Speech Center: starting September 7, 1953, in nursery for deaf children, ages 16 months to 36 months; half-time; 20 hours per week for calendar year (3 weeks vacation); remission of tuition totalling $480 (9 hours maximum load).

Daniel Dauby Working Scholarships: for employment at Cleveland Hearing and Speech Center; remuneration and working time arranged according to demands for clinical service and needs of student.

Graduate Assistantships, granted by Cleveland Hearing and Speech Center: half-time; 20 hours per week (about 30 clinical cases); $1125, $1250, $1400 per year (calendar) with 3 weeks vacation; remission of tuition totalling $480 (maximum load 9 hours per semester); may begin June 15, August 1 and September 1, depending on training.

For above three groups of scholarships and assistantships, apply at once for academic year 1953-54 to George J. Fortune, Director, Cleveland Hearing and Speech Center, 11206 Euclid Avenue, Cleveland 6.

Ohio State University. Scholarships and Fellowships: for graduate study in Audiology; $800 a year for holders of undergraduate degrees; $1000 a year for holders of M.A. in Speech or Audiology; remission

(*See "Opportunities," page* 54)

SPEECH AND SPEECH PERCEPTION

A Summer Meeting Panel Discussion, June 18, 1952

Moderator: CLARENCE V. HUDGINS, PH.D.*

DR. HUDGINS: For you this afternoon we have a panel on what we might consider communication. We are going to talk about speech production and speech perception, or the two sides of the same coin, if you like.

Our first speaker is a teacher of the deaf, and those of you who were at Northampton saw her demonstrate the four-year old class there. It is a pleasure to present to you Miss Marjorie E. Magner, Teacher-in-Charge at Yale House, Clarke School.

BEGINNING SPEECH FOR YOUNG DEAF CHILDREN

MISS MAGNER: Young children who enter schools for the deaf vary greatly in their abilities to communicate orally. This wide variation is due to the differences: in the degree of residual hearing that the children possess, in the ages at which they became deaf, in their general health, in their emotional and social backgrounds, in their mental abilities, and in all the numerous hereditary and environmental influences affecting them.

It is important that there be a definite speech program for these children, not only for their first year in school, but throughout their entire school life—a program that is flexible so as to fit the needs of every child.

It is the purpose of this paper to describe the beginning of the speech program being used at the Clarke School for the Deaf. The children included ranged in ages from four years and four months to five years and three months, in September 1951.

The objectives of our speech program for the children during their first years of school are:

1. To establish an environment wherein the child is happy, secure, and relaxed; and to develop good parent-school relationships.

2. To build up a wide vocabulary and to attain as great an understanding of language through lipreading as possible.

3. To initiate an auditory training program for the purpose of teaching the child to employ whatever residual hearing he may have in all aspects of future educational development.

4. To preserve a pleasant, normal voice quality.

5. To develop in the child the idea that oral communication is meaningful and to encourage him to babble and to say words, phrases, and simple sentences that have meaning for him, even though he may not be able to articulate perfectly.

6. To begin to develop the consonant and vowel sounds, and combinations of those sounds which lead directly to meaningful words.

7. To develop normal speech breathing habits and rhythmic speech patterns so as to avoid metronomic, monotonous, unnatural speech.

Our first objective, to establish an environment wherein the child is happy, secure, and relaxed, is essential in any learning situation, and is especially important in learning to speak. Good parent-school relationships are also important, not only for the child's security, but for actual speech development. For the greatest success in any speech program, parents, teachers, supervisors, and the child must work together. The speech program should not be limited to the classroom.

During the child's first years in school, special emphasis is placed on the development of oral communication, which includes speech perception by means of lipreading and audition, and speech production. Two definite approaches are used simultaneously for the first few months. They are (1) a general or synthetic approach, and (2) a specific or analytic approach.

The synthetic approach refers to everyday conversations between the children and their teachers, supervisors, family, and friends; the general statements that are normally made to any child, such as, "Do you want to go outdoors and play?", "It is time to get ready for supper", "You have

*Department of Research, Clarke School for the Deaf, Northampton, Mass.

a letter from your mother", and so on. All day long, in the dormitory as well as in school, the children are talked to constantly and naturally.

This general approach is utilized in auditory training. In the classroom and dormitory, music and rhythmic games are part of the program. The phonograph, rhythm band instruments, piano, and occasionally other musical instruments are used. The group hearing aid is in almost constant use throughout every school day during the year. The children are encouraged to look and listen in almost every phase of school work.

Through this general approach the children are urged to respond vocally, that is to imitate or approximate speech. Everyone who comes into contact with the children talks to them and encourages them to give back vocal responses even though the responses are often unintelligible. Very early in the year the child learns that he must ask for things he wants. If he wants something at the table he must try to ask for it by approximating the name of the food desired. If he wants permission to go somewhere he must attempt to say where he wishes to go. For example, in September of this year a child babbled "Bububu" when he wanted to say, "I want to go to the playroom." Because the child was giving voice and speaking—saying the only thing he knew how to say—the babbling was accepted as functional speech. The teacher in this instance as in all similar instances gave him the sentence he needed—"I want to go to the playroom." Before long, when that same child wanted to go to the playroom he gave a series of syllables and approximated the word *playroom*. It is interesting to note that the length and the rhythmic pattern of his imitated sentence corresponded with that of the sentence he actually tried to say.

Through the synthetic approach the children made obvious gains in understanding spoken language through lipreading and hearing, they all wanted to wear their hearing aids, their voices were for the most part pleasant, and even the most profoundly deaf child in the group, who has an average of 105 decibels loss in the speech range, babbled freely and imitated words, phrases, and sentences. Quite evidently the children wanted to talk. They found oral communication meaningful and satisfying.

Although the children this year made satisfactory progress in oral communication through the means of the synthetic approach, there was also a need for the analytic approach. The imitated speech for the most part was unintelligible. The children wanted to be understood, and in order to attain intelligible speech the deaf child needs careful instruction by a skilled teacher and conscientious and understanding help from his parents, supervisors, and friends. The hearing child does not acquire good speech without a great deal of listening, imitating and practicing. Often a conscious effort must be made to help him master difficult sounds and words. The deaf child must be given the same advantages as the hearing child insofar as possible, and in addition, because of the handicap, he must be given special help. There isn't any short road and there certainly isn't any easy road. The use of imitated speech can help the young child develop a wholesome speech attitude, good hearing aids are invaluable as an aid to teaching speech to the deaf child, but neither a program of imitated speech alone nor one of hearing aids alone will give the deaf child good, intelligible speech. Both the synthetic and the analytic methods of approach are vital in order to help the deaf child develop oral communication as nearly like that of a hearing child as possible.

Through the analytic approach a combination of visual, kinesthetic, and auditory senses are employed constantly as the teacher and child work together to develop a few very simple consonant and vowel sounds. The first sounds have no specific meaning for the deaf child, just as the early sounds that the hearing child produces are meaningless. The breath sounds of *wh*, *p*—, and *f* were developed first this this year because they were simple, and the child could see the results of his accomplishment by blowing papers, feathers, candles, and so on. Very soon the long vowels *oo* and *a(r)* were developed. Just as soon as the child was able to articulate a consonant and a vowel sound, the two were combined. For example, the child should now be able to say, *poo*, *par*, *foo*, and *far*. No consonant or vowel sound is really learned until it can be used fluently in combination with other sounds. The

child must learn to execute the consonant movements in both the initial and final positions in relation to vowels within syllables. As soon as the *t* and the *th* sounds were developed and put into combinations with vowel sounds, the children had a vocabulary of two words, *two* and *tooth*. It is at this point that the analytic approach begins to be superimposed upon the synthetic approach to speech. When the child tells the teacher that he has a loose tooth, she accepts his statement, but she will not accept any thing but his best speech for the word *tooth*.

There is no specific order in which the sounds are developed, for they should be taught as they are needed, taking into consideration, of course, the relative difficulty. This year one of the children spent his Thanksgiving vacation on a farm. Since he had learned to say the combination *far*, the sound *m* was developed next. This new sound was put into combinations with other sounds and then taught in the word *a farm*. A trip was planned so that all the children might go to a farm. The sound of *k* was needed, for the children wanted to talk about going in a car. The sound was developed, used in combinations with vowel sounds, and in time, the children could say *a car*. As a result of the trip the sounds *ou*, *-a-*, and a final *t* were developed and the words *a cow* and *a cat* were taught. Once a child learns to say a word correctly he is encouraged to use it. Poor imitations of words that a child can say correctly are then considered sloppy speech and are no longer accepted.

At the close of this school year the children in the beginning group now have a vocabulary of eighty-one words that they can say well. It is impossible to estimate the number of words that they use in imitated speech, for they are not restricted in their efforts to imitate any word.

Along with the actual development of words through the combinations of the sounds there is a conscious effort made to promote good breathing habits, rhythm and fluency. Babbling is encouraged from the first week in school. As each new consonant is developed the children learn to babble that sound with the indefinite vowel —*bububu*, *gugugu*, and so on. Through babbling, the child practices all consonant sounds. He learns to increase the number of syllables that he can give with one breath. As the consonant and vowel sounds are put into syllables the child learns to say them smoothly on single breath pulses. A little later he attempts two, three, and four syllables forming a single breath pulse or phrase, such as *far-far, farfarfar*. Through the use of rhythm instruments, simple games, and the group hearing aid, the children learn the common accent patterns in speech such as: (a) The iambic pattern in which there is an unaccented followed by an accented syllable (fu*far*). Later he learns to attach this pattern to a word, *a farm, a car*. (b) The trochaic pattern or the accented followed by an unaccented syllable (*far*fu) as in the word *Mother*. (c) The dactylic pattern, a group of three syllables with the accent on the first, as in the word yesterday. (d) The amphibrach pattern with the accent on the second of three syllables as in *some candy*, or *a baby*. (e) The anapestic pattern, in which the accent is on the last of three syllables, *a balloon*. The child is encouraged to speak the entire accent pattern on a single breathing movement. The children frequently repeat these accent patterns as they work and play. On the playground one might hear a child say again and again as he swings up and down, "bu*bar*bu." He is learning to control his breathing through play with his voice.

The child's lipreading vocabulary is carefully and systematically broadened, and he is given special practice in learning to discriminate among various impulses and sounds through his sight and hearing and through hearing alone.

To summarize briefly, there are two definite approaches to oral communication being used simultaneously during the first years that the children are in school—the general or synthetic, and the specific or analytic. It is believed that through the use of the combination of the two approaches, greater gains are being made than would be found if only one approach were followed. During the first year the specific approach begins to be superimposed upon the general approach. That is, as soon as a child learns to say a word correctly he is required to use it rather than any imitated form of the word. During the second year, or in some cases the third year of school, the children should be able to

articulate combinations of all speech sounds. The two avenues for teaching speech become completely converged at this point. Only the child's best speech is acceptable.

These first years are just the beginning of the complex speech program for the deaf child. Speech cannot be limited to the classroom, neither can it be limited to the first years in school. For a successful speech program everyone associated with the child from the time he enters school until he graduates should be responsible for helping him to speak intelligibly and to the best of his ability.

DR. HUDGINS: Our next speaker is an old friend of mine, and a former colleague, who has always been willing to drop in and fill an assignment.

The Bell Laboratories, with which our speaker is associated, are concerned with speech; they sell it, they work on it, they transmit it, and they make all sorts of experiments with it. Their engineers, then, should come down to earth and talk to us about speech at various times.

This afternoon, one of them has consented to do so. We are going to hear from Dr. Gordon E. Peterson, of the Bell Telephone Laboratories, Murray Hill, New Jersey.

ACOUSTICAL GESTURES IN THE SPEECH OF CHILDREN

DR. PETERSON: The production of speech involves almost continuous movement of the articulatory organs. This principle is evident, for example, in the writings about vocal gestures by Sir Richard Paget[1] and in the writings by Stetson and Hudgins[2] on the nature of the syllable. The movements can readily be observed by direct examination of the vocal mechanism, or by high speed motion pictures and x-ray techniques.

By means of the sound spectrograph it is also possible to observe the time variations in the acoustical structure of speech. A method of plotting the information which is obtained from the sound spectrograph has been developed, which has proved to be fundamental in the phonetic representation of speech. This method makes it possible to show the changes in the continuant portions of speech in a form that is significant in acoustical phonetics. The resulting patterns have been called the acoustical gestures of speech. A study of these acoustical gestures offers an important method of observing the acquisition of articulatory skills by children.

Acoustical Analysis

The positions of the articulators and their movements within the vocal cavities,

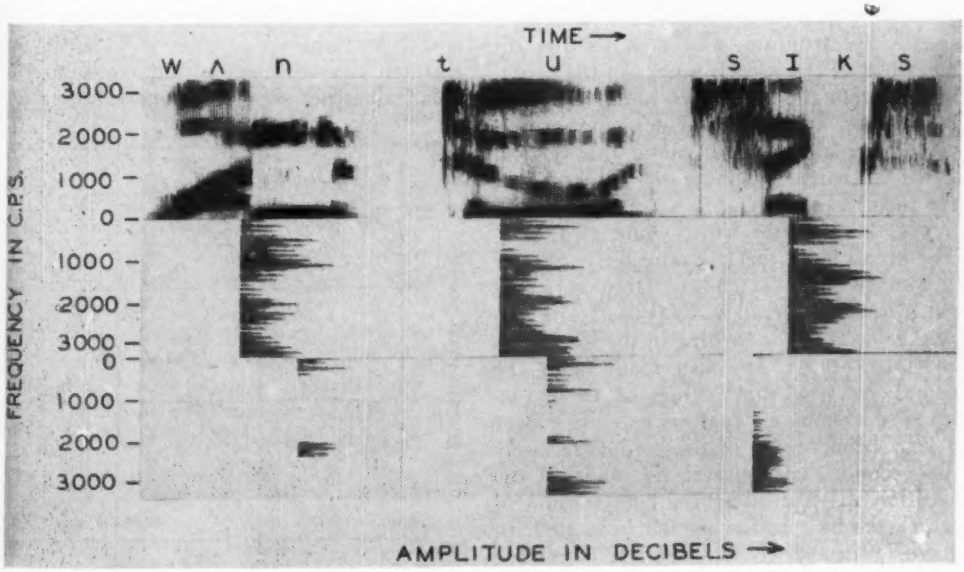


FIG. 1—BROAD BAND SPECTROGRAMS AND AMPLITUDE SECTIONS OF THE DIGITS "ONE, TWO, SIX."

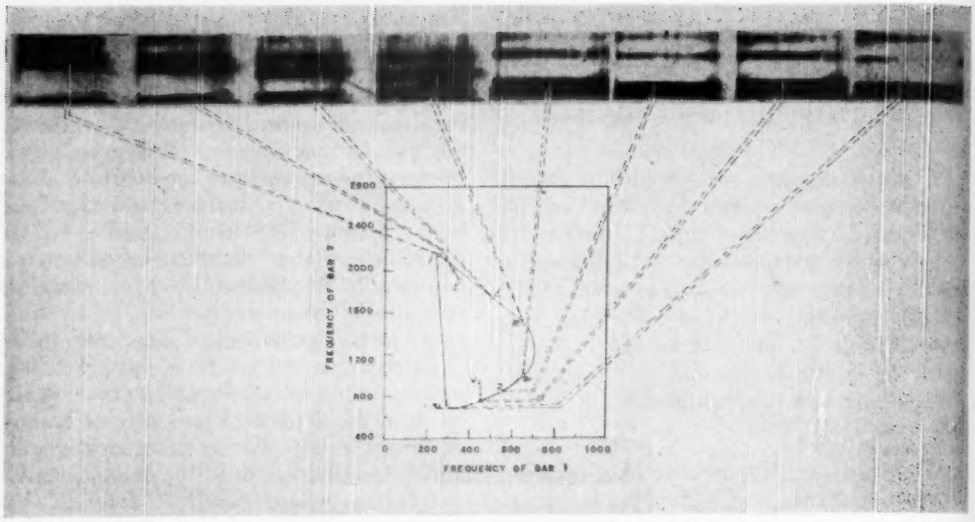


FIG. 2—BROAD BAND SPECTROGRAMS AND A BAR-2 VERSUS BAR-1 PLOT FOR THE VOWELS

and the generation of tone and noise within the vocal cavities are all involved in producing the acoustical waves of speech. The mathematical calculation of the cavity positions from the acoustical wave form is indeed difficult; likewise, the derivation of the speech wave when the vocal cavity shapes and vocal cord movements are known is a highly complex process.[3]

We do find, however, that the gross cavity positions and movements can rather readily be described from observing acoustical wave analyses. Let us refer first to a speech spectrogram which shows the dimensions of the speech wave. In the sound spectrogram time is shown along the horizontal axis, and the frequency composition of the signal is shown along the vertical axis; intensity is shown by blackness in the picture.

Fig. 1 shows the words "one, two, six." The broad band spectrograms have a linear frequency scale extending from zero upward to approximately 3500 cps.[4] The amplitude sections or spectra in the lower two rows of Fig. 1 are also made with the sound spectrograph.[5] Each of these pictures represents an analysis extending over a very brief period of time, approximately .02 second. The analysis is made at the position in time along the spectrogram at which the base of the section is located. In these lower two rows of Fig. 1, amplitude is shown along the horizontal axis and is linear in decibels; the highest amplitudes are about 35 db above the reference baseline. Frequency extends from zero downward in each section with a linear scale to approximately 3500 cps.

It will be noted that most of the sections were taken from phonated portions of the syllables. The result is that the individual harmonics or overtones can be seen in these sections. Since the scale is linear the harmonics are equally spaced and their strength in the speech is shown by their length in the pictures. The different harmonic structures of the vowel and consonant sections are of interest. The section through the voiceless initial consonant in "six," does not show harmonics, but rather

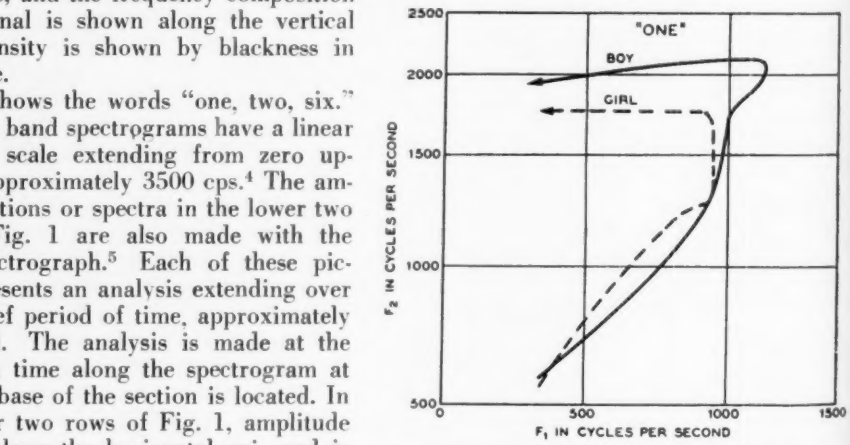


FIG. 3—ACOUSTICAL GESTURES FOR THE DIGIT *ONE* SPOKEN BY TWO CHILDREN.

shows a random sort of energy distribution.

The Vowels

It will be observed in these pictures that there are certain regions of energy concentration where the harmonic lines are longer. The "bars" of visible speech are based on these regions of reinforcement[6]; in fact, if we observe that the frequency scale for the sections is inverted, we can relate the frequency positions of the bars in the spectrograms to the energy peaks in the amplitude sections. In the spectra the regions of energy concentration are called formants by those who work in experimental phonetics.

In visible speech terminology the bars have been assigned numbers, beginning with that lowest in frequency and progressing upward. We can measure the position in the frequency scale of each of these bars. In Fig. 2 is shown a graph in which the frequency of bar-2 is plotted against the frequency of bar-1. This plot is for the vowels, as indicated in the International Phonetic Alphabet.

A study of Fig. 2 will show that, except for the orientation, the vowels are in essentially the same relationship to each other as that shown in the tongue diagrams which phoneticians have employed for many years. By placing the origin at the upper right the diagram can be shown to correspond very well to the vowel diagram. In such a plot it can be seen that there are two basic configurations, one for unrounded vowels and one for rounded vowels.[7]

Acoustical Gestures

In the production of speech we form in sequence the various vowels and consonants of our dialect. The articulatory positions for these sounds are very well known to teachers of speech and hearing defectives. It is well known, also, that the degree to which these articulatory positions are approximated in speech in large measure determines the distinctness of the speech.

The construction of the vocal mechanism is such, however, that it cannot jump directly from one speech sound to the next. In fact, most of the time in speaking is spent in the transitions, that is most of the time is devoted to moving from the position for one speech sound to that for the next. These transitional or influence regions are very evident in the pictures of visible speech, and the time devoted to the corresponding movements is readily observed there. Such movements within the articulatory mechanism are reflected directly in the acoustical waves and are shown in the patterns made by the sound spectrograph.

While the transitional movements may be looked upon merely as guiding paths to the positions of importance, their significance is greater than might be suspected. They make a rather smooth continuum out of what otherwise would be a sequence of discrete elements. When we listen to speech we derive phoneme sequences, that is, we quantize speech in perception. It is fundamental in the dynamics of perception, however, that we cannot interpret a series of disjointed stimuli at such rapid rates as those at which speech occurs. This is true in both vision and audition. In fact, if we splice together by means of magnetic tape, a series of sustained vowels and consonants to produce speech at its normal rate, we find that the speech is essentially unintelligible.

We must not be deceived by this experiment, however; any successful teacher of speech knows that speech is built around certain articulatory positions. In effective teaching it is necessary to teach these positions, and upon these the dynamics of speech must then be constructed.[8] Further, the fundamental concepts of quantization in both phonetics and phonemics are based upon the significance of articulatory and acoustic position.

If we refer once again to Fig. 1, the bar movements can readily be observed in the syllables depicted there. When we submit such a spectrogram to a plot of the type shown in Fig. 2, we obtain a continuous line. This line shows the various bar-2 versus bar-1 positions as time progresses throughout the syllable. Thus far these plots have been applied chiefly to the vowel portions of the syllable.

In Fig. 3 are shown bar-2 versus bar-1 traces for the digit "one" as spoken by two children. Such traces form a convenient representation of the acoustical gestures of which we speak.

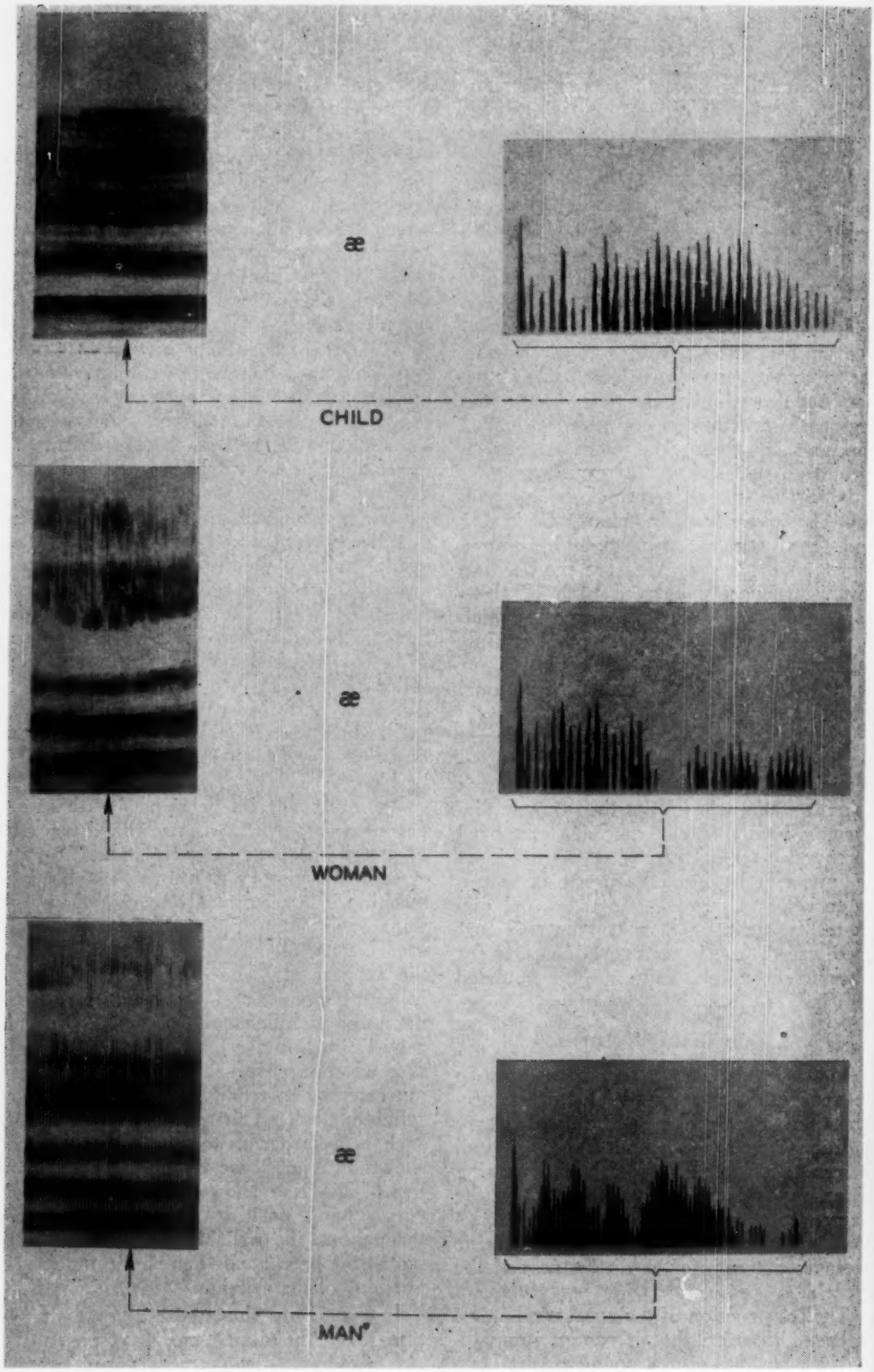


FIG. 4—BROAD BAND SPECTROGRAMS AND AMPLITUDE SECTIONS FOR A VOWEL PRODUCED BY A MAN, A WOMAN, AND A CHILD.

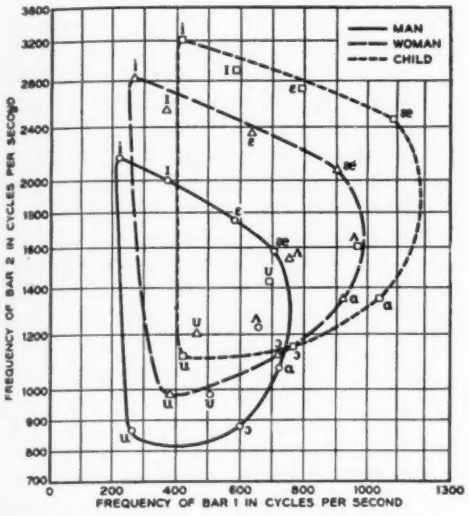


FIG. 5—VOWEL LOOPS FOR A MAN, A WOMAN, AND A CHILD

As one might suspect, when we analyze the vowels of different speakers we find that the frequency positions of the bars do not correspond. This effect is shown in Fig. 4, which displays broad band spectrograms and amplitude section for a vowel, as pronounced by a man, a woman, and a child.

Fig. 5 shows the bar-2 versus bar-1 plot of the vowels for three such speakers.[9] It will be noted that the absolute frequency values differ for the various speakers, but the relationships among the vowels are essentially the same in all three vowel loops.

In Fig. 6 the acoustical gestures are shown for the same word by a man and a child. The similarity of these traces for this one syllable is very evident. As would be expected after the construction of Fig. 5, however, the traces do not take the same positions in frequency. This is obviously due to the difference in size between the vocal cavities of a man and a child.

Teachers of speech have long recognized the dynamical nature of speech, and it is generally known that teaching articulatory (or acoustical) position alone is inadequate for teaching the correct production of normal speech. These positions must be built into the dynamics of conversational speech. In these acoustical gestures we probably find no new principles of this sort, but we do find a very strong confirmation of the necessity for including those steps in the teaching process which deal with the production of the syllable and larger linguistic units as a whole. When the techniques of visible speech have become more generally available, these methods of portrayal will offer a means, perhaps an important one, of observing the acoustical gestures of the child who is acquiring speech, and thereby of helping him to achieve correct methods of articulation.

References

1. Sir Richard Paget, *Human Speech* (Harcourt Brace and Company, Inc., New York: 1930).
2. R. H. Stetson, *Motor Phonetics* (North-Holland Publishing Company, Amsterdam: 1951).
3. H. K. Dunn, "The Calculation of Vowel Resonances, and an Electrical Vocal Tract," *The Journal of the Acoustical Society of America*, November, 1950, pp. 740-753.
4. W. Koenig, H. K. Dunn, and L. Y. Lacy, "The Sound Spectrograph," *The Journal of the Acoustical Society of America*, July 1946, pp. 19-49.
5. L. G. Kersta, "Amplitude Cross-Section Representation with the Sound Spectrograph," *The Journal of the Acoustical Society of America*, November, 1948, pp. 796-801.
6. R. K. Potter, G. A. Kopp, and H. C. Green, *Visible Speech* (D. Van Nostrand Company, Inc., New York: 1947).
7. G. E. Peterson, "The Phonetic Value of Vowels," *Language*, October-December, 1951, Fig. 3.
8. C. Van Riper, *Speech Correction: Principles and Methods* (Prentice-Hall, Inc., New York: 1939).
9. G. E. Peterson, "Vocal Gestures," *The Bell Laboratories Record*, November, 1951, Fig. 4.

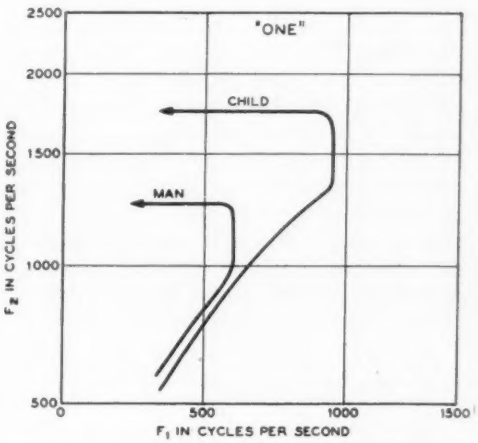


FIG. 6—ACOUSTICAL GESTURES FOR THE DIGIT *ONE* SPOKEN BY A MAN AND A CHILD.

DR. HUDGINS: We now go from speech to speech perception. In order to get an estimate of the amount of speech perception that a pupil has, how well he understands speech, we have to have certain types of tests. It is on this problem of testing that our next speaker is going to address us. She is Miss Marian Quick, Supervising Teacher at the Western Pennsylvania School, Pittsburgh, Pennsylvania.

A TEST FOR MEASURING ACHIEVEMENT IN SPEECH PERCEPTION AMONG YOUNG DEAF CHILDREN[1]

MISS QUICK: The ever-widening use of hearing aids in the education of deaf children has been accompanied by numerous studies of the methods and benefits of acoustic training. Enthusiastic teachers have said that as a result of a carefully planned auditory training program, pupils show an acceleration in the achievement of lipreading, speech, and language. On the other hand there are those who claim that acoustic training deprives pupils of needed work in other areas. Evidence is steadily accumulating, however, which proves that even those pupils who are totally unable to understand speech by ear alone, regardless of the amount of acoustic training they receive, may be trained to combine lipreading with small auditory clues and show a decided increase in speech perception. Using subjects ranging in age from ten to sixteen years, Hudgins[4,22], for example, found an average gain of 23 percent in words understood through lipreading and hearing combined, over lipreading alone. The tests and experimental methods of Hudgins and other investigators make it possible to measure the achievements of pupils in acoustic training at advanced educational levels. However, no tests are at present available for measuring the results of such training for pupils at the early primary level. It was to meet the need of an achievement test to measure the speech perception of young deaf children that the present study was undertaken.

A speech perception test must adhere to certain basic principles that are characteristic of articulation tests. Articulation tests, first standarized by Bell Laboratories[3] to rate communication equipment, involve a speaker, selected test material, transmitting equipment, and a listener who records his responses to the test material. In a report on experiments with these tests conducted in the Psycho-Acoustic Laboratories at Harvard, Egan [1] states that an articulation test should provide a representative sample of English speech in each of a number of interchangeable lists which are equivalent in phonetic composition, average difficulty, and range of difficulty. Moreover, he specifies that the test items be composed of familiar material which is uniform in respect to syllabic structure.

In addition to the above requirements a word test for small deaf children must provide a method of responding that would measure speech perception regardless of the subjects' lack of capacity in other areas. In this case, a multiple choice type of test was utilized. This type of test has the disadvantage of obscuring true scores, since it is possible by chance alone to make a percentage of correct responses relative to the number of choices in the group. However, the multiple choice test offered the best solution to the young deaf child's limited ability to respond, since it requires merely underlining a word rather than writing it. Moreover, it utilizes his more extensive reading vocabulary as compared with his meager writing vocabulary. Finally the length of the test was adjusted to the short attention span of young children. Lists of twenty-five words proved to be of an optimum length for this test.

Four tests were developed and tried out experimentally before one was found that met the basic requirements of an articulation test. Answer sheets were prepared in which each item appeared in random order with two other words to form a group of three choices. The first test list contained monosyllabic words selected from first and second year vocabulary lists of the Primary Department at Clarke School. In addition to meeting the requirements of familiar material and uniform syllabic structure this test also contained a representative sample of sounds as they occur in English speech. Each of the 25 items was grouped with two words which did not appear in the test list. Tryouts with

[1]This paper is a summary of an unpublished thesis submitted to the Faculty of the Department of Education, Smith College, in partial fulfillment of the requirements for the degree of Master of Arts.

this test showed that it was not sufficiently difficult and failed to discriminate between pure lipreading and lipreading and hearing combined, since all scores for those two testing conditions were 90% or better. An analysis of the results suggested that the sensitivity or difficulty of the test would be increased if the three words in the multiple choice groups presented a high degree of visual and acoustic similarity. Homophenous words offered the best means of introducing these elements into the test. Usually such words differ only in the substitution of a consonant counterpart for a surd, nasal, or sonant sound. For example, *pig*, *big*, *pink*. The subsequent trial lists, therefore, employed test items grouped with two other homophenous or near homophenous words. In each of the tryouts an item analysis of the data obtained was used as a basis for eliminating words that failed to contribute to the sensitivity of the test. The final item analysis of the tryouts showed that fifty words on the multiple choice answer sheet could be utilized to provide two equivalent lists, designated as SP-1 and SP-2, or more fully, Speech Perception List-1, and Speech Perception List-2. An attempt to make up a third list from the remaining twenty-five words in the multiple choice groups was unsuccessful because in many cases these words lacked sufficient difficulty to constitute a test item. However, the words contribute to the difficulty of the test as a whole by requiring pupils to select one of three responses instead of two.

The testing methods used to evaluate the adequacy of SP-1 and SP-2 were derived from studies presented by the Ewings[2], Johnson[5,6], and more recently Numbers and Hudgins[4,7]. These investigators suggest that an individual's response to acoustic training may be measured by comparing his average scores obtained under three testing conditions—lipreading, lipreading and hearing combined, and hearing alone. Achievement in acoustic training is shown by the degree that scores increase when lipreading is supplemented by hearing. On the other hand, a pupil's understanding of speech or his achievement in speech perception may be represented by the magnitude of his scores obtained from any one of the three testing conditions. Hence, this test designed to measure achievement in acoustic training was administered in the following manner. Under the conditions of lipreading-hearing, the pupils looked at the speaker as the lists were read while the volume control of the amplifier for the hearing aid was turned to its maximum output level. Pupils selected the speech level in their earphones by adjusting their individual volume controls. Under the condition of lipreading alone the volume control of the amplifier was adjusted so that the speech level was below the hearing thresholds of the pupils. During the test condition of hearing alone the pupils did not watch the speaker, but merely listened while the amplifier was again adjusted to the point of maximum output.

Forty-six pupils enrolled at the Clarke School for the Deaf were chosen for the study. These children varied widely in such factors as age, school experience, hearing loss, and response to acoustic training. Eighteen scrambled versions were arranged for each list. Multiple choice answer sheets were prepared, corresponding to the scrambled arrangements. All tests for a given class were administered over a multiple outlet type of hearing aid by their own teacher or one familiar to them. The items were read at a normal conversational level and introduced by the carrier phrase, "Draw a line under————." A group of seven lists each were read for the lipreading and the lipreading-hearing tests, and four lists for the hearing-only test.

Average scores for the lists, in terms of the percentage of correct responses, were determined for each of the three testing conditions. Furthermore, the relative difficulty of each test item was determined by means of item analysis for the conditions of lipreading and lipreading-hearing. These data for average scores and relative word difficulty were analyzed statistically to determine equivalence in both the average difficulty and in the range of difficulty betwen the two lists, and the validity and reliability of the test.

An equivalence of average difficulty and range of difficulty was necessary if the two lists were to be used interchangeably. The overall average difficulty for the two lists was shown to be equal when comparisons were made on the basis of average scores obtained from each of the three testing conditions. Another measure of difficulty,

relative word difficulty, was determined from data obtained by item analysis. The relative difficulty of a word is determined by the ratio of the number of times it is missed and the total number of times it is presented. This relationship, when converted to a percentage, provides a convenient comparative measure. Comparisons made of two lists for both lipreading and lipreading-hearing revealed that they were essentially equivalent in respect to relative word difficulty. No item analysis was made for the condition of hearing alone since the severe losses obtaining in the experimental group would tend to reduce such scores to the level of chance or 33 of the items correct. In all cases of comparison the small differences between means were less than their standard deviations.

The range of difficulty among the items is also important in determining equivalence. Lists may be equal in overall difficulty and in average word difficulty but, at the same time, they may differ widely in the distribution of easy and difficult items. The data for determining the range of difficulty for the two lists was obtained from the item analysis data. Comparisons were made by arranging the words in each list in an order of decreasing difficulty. The range of difficulty was compared in this way for both lipreading and lipreading-hearing. The comparisons showed that the lists are essentially equivalent in range of difficulty with only minor discrepancies at the extremes. The degree of equivalence established for overall difficulty, relative word difficulty, and range of difficulty suggest that the two lists may be used interchangeably.

A copy of one scrambled version each of the two test lists, SP-1A and SP-2A, is presented in Table 1. These are used as call-lists. Copies of the corresponding multiple-choice score sheet for the two lists are presented in Table 2. The correct test words are underlined in the score sheets. These are used by the pupils in making their response to the words in the call lists.

The validity of the test was found to be high when average test scores of a group of subjects were compared with independent estimates of the response of this group to acoustic training. Further evidence of validity was demonstrated by the fact that there were significant differences between the average scores obtained under the conditions of pure lipreading and lipreading-hearing when comparisons were made on the basis of the group of pupils who had responded favorably to acoustic training.

TABLE 1
Call Lists for SP-1A and SP-2A

SP-1A	*SP-2A*
1. took	1. look
2. think	2. thick
3. man	3. bad
4. got	4. hot
5. rode	5. wrote
6. class	6. glass
7. beads	7. beans
8. half	8. calf
9. my	9. buy
10. caught	10. corn
11. shirt	11. church
12. wet	12. when
13. goat	13. coat
14. art	14. hard
15. guess	15. yes
16. gum	16. come
17. pig	17. pink
18. glove	18. love
19. hen	19. head
20. shoes	20. juice
21. down	21. town
22. hand	22. and
23. thank	23. that
24. bone	24. boat
25. plate	25. played

The reliability of the test was measured in two ways. The first method consisted of correlating the average scores of SP-1 with SP-2 for each of the two testing conditions — pure lipreading, and lipreading combined with hearing. The coefficient of correlation for the two forms of the test for pure lipreading was .69±.08. In the latter case, the coefficient was .88±.04. A second test of reliability was made by correlating the average scores of even and odd presentations of the two forms of the test for both lipreading and lipreading-hearing. The reliability of SP-1 turned out to be .81±.05 for pure lipreading and .84±.04 for lipreading-hearing. For SP-2 the coefficient of correlation for lipreading was .73 ± .07 and for lipreading-hearing .93±.02. The reliability coefficients obtained for lipreading and hearing combined may be considered high for this type of test. The somewhat lower correlations for pure lipreading may be explained by the operation of chance factors when the fine visual discriminations required by the similarity of the test items is unaided by auditory clues.

TABLE 2
Multiple choice score sheets for the call-lists in Table 1.

NAME .....

LIST SP-1A

1.	good	look	*took*
2.	*think*	thick	thing
3.	bat	bad	*man*
4.	cot	*got*	hot
5.	roll	*rode*	wrote
6.	glass	glad	*class*
7.	beets	*beads*	beans
8.	*half*	calf	laugh
9.	*my*	pie	buy
10.	*caught*	corn	horn
11.	church	*shirt*	skirt
12.	*wet*	when	well
13.	cold	*goat*	coat
14.	card	*art*	hard
15.	*guess*	yes	yet
16.	*gum*	come	cup
17.	big	pink	*pig*
18.	love	tough	*glove*
19.	*hen*	get	head
20.	choose	*shoes*	juice
21.	loud	town	*down*
22.	hat	and	*hand*
23.	than	that	*thank*
24.	bowl	*bone*	boat
25.	place	*plate*	played

NAME .....

LIST SP-2A

1.	good	*look*	took
2.	think	*thick*	thing
3.	bat	*bad*	man
4.	cot	got	*hot*
5.	roll	rode	*wrote*
6.	*glass*	glad	class
7.	beets	beads	*beans*
8.	half	*calf*	laugh
9.	my	pie	*buy*
10.	caught	*corn*	horn
11.	*church*	shirt	skirt
12.	wet	*when*	well
13.	cold	goat	*coat*
14.	card	art	*hard*
15.	guess	*yes*	yet
16.	gum	*come*	cup
17.	big	*pink*	pig
18.	*love*	tough	glove
19.	hen	get	*head*
20.	choose	shoes	*juice*
21.	loud	*town*	down
22.	hat	*and*	hand
23.	than	*that*	thank
24.	bowl	bone	*boat*
25.	place	plate	*played*

Evidence of the test's ability to measure achievement in acoustic training among young deaf children was provided in data obtained from nine seven- and eight-year-old pupils who were included in the experimental group. Only one of the children had been enrolled at Clarke School for more than two years. The average hearing losses in this group of pupils ranged from 68 to 105 decibels in the speech range. Achievement in acoustic training, if measured in this group, should be shown by an increase in speech perception scores for the condition of lipreading and hearing combined. In all cases higher scores appeared when lipreading was supplemented with hearing. Three children showed undisputed gains of 28, 12, and 11 points; three showed gains of 5 and 6 points; while the three most profoundly deaf children showed small but positive gains of 3, 2, and 1 points. Thus the test may be said to provide a measure of achievement in acoustic training among young deaf children.

To sum up briefly, it may be said that lists SP-1 and SP-2 adhere closely to the basic principles of articulation tests, and within the limits of this study are a valid and reliable measure of achievement in speech perception. They contain familiar monosyllabic words which represent all of the English speech sounds. Moreover, they are equivalent in difficulty and in such phonetic elements as voiced and unvoiced fricatives and stops, transitional consonants, semi-vowels, and vowels. An adequate number of test forms may be provided by different scrambled versions of the lists.

Bibliography

1. Egan, J. P., "Articulation Testing Methods II," *Office of Scientific Research and Development, National Defense Research Committee*, OSRD No. 3802, Nov. 1944.
2. Ewing, I., and Ewing, A. W. G., *The Handicap of Deafness*, London: Longmans, Green and Co., 1938.
3. Fletcher, H., and Steinberg, J. C., "Articulation Testing Methods," *Bell System Technical Journal*, 1929, 8, 806-854.
4. Hudgins, C. V., "Lipreading and Hearing Aids," *Hearing News*, 1948, 16, 8-10, 20-22.
5. Johnson, E. H., "The Ability of Pupils in a School for the Deaf to Understand Various Methods of Communication," *American Annals of the Deaf*, 1948, 93, No. 2, 194-213.
6. ————, "Testing Results of Acoustic Training," *American Annals of the Deaf*, 1939, 84, 223-233.
7. Numbers, M. E., and Hudgins, C. V., "Speech Perception in Present Day Education for Deaf Children," *The Volta Review*, 1948, 50, 449-456.

DR. HUDGINS: We have two more papers, and then a question period.

Our next speaker is Miss Louise Hopkins of the Department of Research at the Clarke School.

THE RELATIONSHIP BETWEEN DEGREE OF DEAFNESS AND RESPONSE TO ACOUSTIC TRAINING*

MISS HOPKINS: There are two independent measures of hearing, the audiometer test and the speech perception test. A pure tone audiometer measures the acuity of the auditory apparatus. It gives us the intensity of the minimal audible sound over a wide frequency range to which an ear can respond. A speech perception test, using standard speech material, measures the child's ability to understand speech.

Congenitally deaf children may be tested successfully by means of the audiometer, but speech perception tests cannot be used as a test of hearing ability until the children have undergone a period of acoustic training. Even after a long period of such training the more profoundly deaf child may not be able to respond perceptively to word lists or other speech materials by ear alone. A properly administered acoustic training program, however, enables most of our deaf children to employ the remnant of hearing effectively as an aid to the eye in understanding speech. Speech perception tests may be used, therefore, as a measure of the effectiveness of acoustic training. Experience has shown us that there are wide differences in the response to acoustic training even among pupils who apparently have very similar hearing losses as measured by the audiometer. The purpose of this paper is to examine speech perception data obtained from a group of deaf children and to make comparisons with these and other audiometric data in an effort to determine what relationships may exist among them.

A speech perception test may be used with deaf children in three ways:

1. To measure lipreading ability using eyes alone.
2. To measure hearing ability using ears alone, employing amplified speech.
3. To measure lipreading and hearing ability combined, using both eyes and ears.

Since very few of our children can understand speech through hearing alone, the test scores used in this paper were measures of lipreading ability and of lipreading plus hearing ability. The differences between these two scores may be used as a measure of the contribution of the ear to the process of speech perception, and therefore the degree of response to acoustic training.

It has been assumed that there is a close correlation between the audiometer test and any other independent measure of hearing. Among persons with normal hearing and among those with slight losses, we do find this correlation. However, congenitally deaf children, either partially or profoundly deaf, present a different picture. Before they have received acoustic training, they have no understanding of speech. Acoustic training is the means by which auditory speech perception may be brought about. Since individual deaf children may respond differently to such training, however, the correlation between hearing loss for pure tones and speech perception will be low.

It has been a common experience among teachers of the deaf to find that children with similar audiograms differ widely in their response to acoustic training. We might expect that those children with the greatest amount of residual hearing would have the highest speech perception scores. However, we find that even after several years of acoustic training, there is still a very wide variation in speech perception scores. Many children with relatively little residual hearing as measured by the audiometer have responded surprisingly well to acoustic training, while some children with relatively large amounts of residual hearing do not respond as well as we might expect, and their speech perception scores are lower than those of children with much less residual hearing.

In order to study the problem of the relationship between degree of deafness and response to acoustic training, a total of 79 Clarke School children, all pupils in the Upper and Middle Schools, were first tested on the pure tone audiometer and were then given speech perception tests to measure

*By Louise A. Hopkins, M.A., and Clarence V. Hudgins, Ph.D.

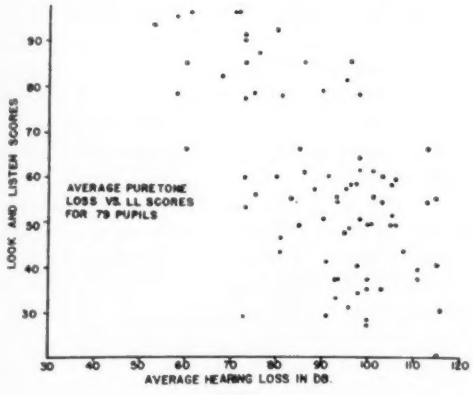


FIGURE 1

lipreading ability, and to measure lipreading and hearing ability combined. Standard PBF word lists were used and each child's "look-and-listen" score is based on from two to six lists of 50 words each. The children who had just come up from the Lower School this past year were tested with Miss Quick's test which has just been described for you. All of the children have had at least three years of acoustic training, and most of them have had considerably more than three years. The results of the analyses of these tests follow.

The average hearing losses for pure tones of the entire group were plotted against their look-and-listen scores to determine whether there was a correlation between the pure tone test and the speech perception test.

Figure 1 shows a scattergram of the scores. The hearing losses range from 55 to 110 db. The look-and-listen scores range from 20 to 96 percent. Ordinarily we might expect to find a much higher correlation than appears between these two variables. Obviously many children who have hearing losses of 80 decibels or more have relatively high look-and-listen scores. The range of scores for this group is from 20 to 85 percent. The explanation lies in the fact that they have all had considerable experience in listening through acoustic training, but have not responded to the same degree.

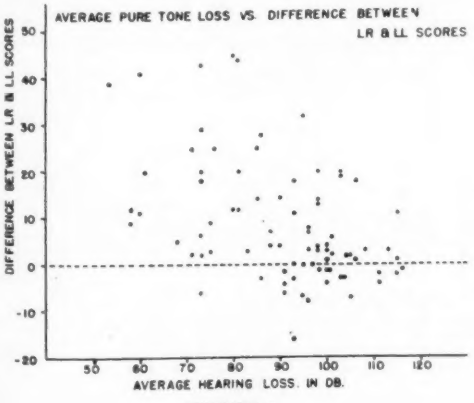


FIGURE 2

The look-and-listen scores, of course, include the effects of lipreading as well as the contributions of the ears. The lipreading factor may be partly responsible for this low correlation. A second scattergram presented in Figure 2 shows the average hearing losses plotted against the difference scores. This difference score, which is the difference between the look-and-listen and the pure lipreading scores, is a better measurement of response to acoustic training, since it represents the contribution of the ear in the speech perception process. The data in Figure 2 show that there is even less correlation between the two variables when the effect of lipreading is deducted from the speech perception score. The difference scores range from —16 to 45.[1] The two pupils with the highest difference scores have hearing losses of 80 decibels or more, while those whose hearing losses range from 58 to 70 decibels have scores which range from 4 to 42.

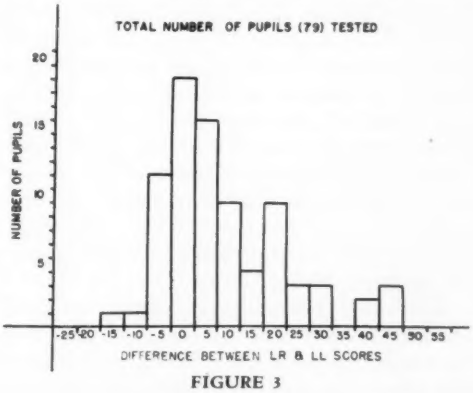


FIGURE 3

[1]Negative differences between look-and-listen and lipreading scores may result from two factors: (1) Purely random variations which are present in any test situation, and (2) the factors of distraction caused by the presence of high level sound during the look and listen tests. Thus sound, instead of aiding, appears to interfere with lipreading. The random variations explain the smaller negative scores, since the standard error of the testing method has been determined to be approximately five percentage points. The larger differences must be attributed to the factor of distraction.

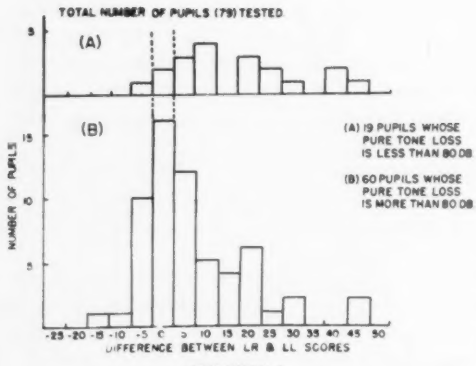

TOTAL NUMBER OF PUPILS (79) TESTED
(A)
(B)
(A) 19 PUPILS WHOSE PURE TONE LOSS IS LESS THAN 80 DB
(B) 60 PUPILS WHOSE PURE TONE LOSS IS MORE THAN 80 DB
NUMBER OF PUPILS
-25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45 50
DIFFERENCE BETWEEN LR & LL SCORES

FIGURE 4

Figure 3 shows the difference scores plotted in a distribution curve without taking into account the degree of hearing loss. This method of presentation shows more clearly the wide range of response to acoustic training within the entire group of 79. The scores of 44 pupils fall between plus or minus 7 percentage points. These may be considered as having made no gains as a result of hearing. The hearing losses of this group cover the entire range from 70 to 110 db (See Figure 2). The scores of 33 pupils in this distribution showed gains ranging from 8 to 45 percentage points. The hearing losses in this group range from 55 to 110 db.

The next type of analysis was designed to show further how the response to acoustic training was affected by degree of hearing loss. The entire group of pupils was divided into two groups: (A) Nineteen children whose average hearing losses were less than 80 decibels, and (B) sixty children whose average hearing losses were 80 decibels or more. Difference scores were again plotted in frequency distributions as shown in Figure 4. The range of differences remains about the same regardless of whether the hearing loss is relatively mild or severe.

Finally, there is the possibility that the extent of the frequency range of the ear as shown by the audiogram may be a factor in the response of the deaf child to acoustic training. The audiograms of the pupils in this study showed a wide variety with respect to the extent of the frequency range. In order to determine whether or not the extent of the frequency range of the ears affected achievement in acoustic training the profoundly deaf group (losses of 80 db or more) was divided into three groups: (A) ten pupils whose audiograms extend through 8,000 cps. (B) twenty-five pupils whose audiograms extend through 4,000 cps., and (C) twenty-five pupils whose audiograms extend through 2,000 cps. or less.

Figure 5 shows the frequency distributions of the difference scores for these three groups. There are only slight differences in the range of scores for the three groups. As the frequency range of the ear is restricted, there is some reduction in the range of the scores, though not nearly as much as might be expected. It is quite obvious that profoundly deaf children who cannot hear tones beyond 2,000 cps. and even some whose audiograms cut off at 1,000 cps. profit to an amazing degree from acoustic training.

In conclusion we must say that there appears to be a wide variation in the response to acoustic training in a group of deaf children. This variation does not appear to depend upon either the relative severity of the hearing losses or upon the extent of the frequency range of the ear. The fact that a large number of children with hearing losses of 80 db or more respond favorably to an intensive acoustic training program suggests strongly that all deaf children should be given the opportunity for developing the remnant of hearing from the time they enter school. Many of the profoundly deaf children may never become able to understand speech by ear alone. Given the proper training, however, they will be able to employ the ear as an aid in speech perception. It is not possible to predict how much benefit an individual child will derive from such a program.

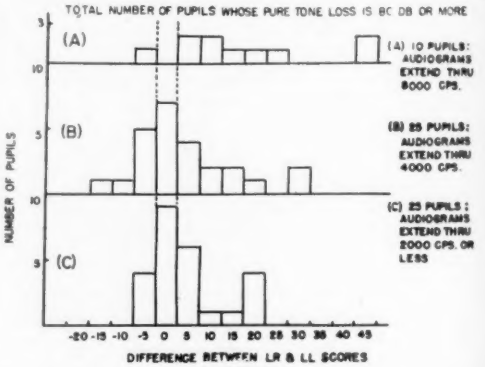

TOTAL NUMBER OF PUPILS WHOSE PURE TONE LOSS IS 80 DB OR MORE
(A)
(B)
(C)
(A) 10 PUPILS: AUDIOGRAMS EXTEND THRU 8000 CPS.
(B) 25 PUPILS: AUDIOGRAMS EXTEND THRU 4000 CPS.
(C) 25 PUPILS: AUDIOGRAMS EXTEND THRU 2000 CPS. OR LESS
NUMBER OF PUPILS
-20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45
DIFFERENCE BETWEEN LR & LL SCORES

FIGURE 5

Often several years may elapse before results become apparent. We feel sure, however, that all children benefit from intensive work in acoustic training, to a greater or a lesser degree, and that teaching through eyes and ears together should be constant throughout each child's school life.

PROGRESS REPORT ON AN ACOUSTIC TRAINING EXPERIMENT

DR. HUDGINS: This is a brief report on an acoustic training program now in progress at the Clarke School. The part of that program covered in this paper was conducted during the two years of 1948 and 1950. The research program was sponsored by the Committee on Deafness of the National Research Council. A specially designed group hearing aid was provided by the Committee that incorporated all of the desirable features such as ample power output, high fidelity, and compression amplification. The equipment was constructed by engineers at Central Institute for the Deaf and installed at the Clarke School in a sound-treated room in the early spring of 1948.[1] A class of eight pupils in their second year in the Middle School was chosen as the experimental class for a two-year period. Six of these were profoundly deaf, with hearing losses ranging from 75 to 95 db in the better ears. Two of the pupils were considered partially deaf with losses of 65 db.

The general objectives of the program were two: (1) To determine what additional benefits, by employing the best hearing aid equipment procurable, we may expect as compared with those obtained by means of the standard equipment then available, and with which most of our classrooms were equipped. (2) to what degree profoundly deaf pupils may benefit by an acoustic training program in which this special hearing aid equipment is used.

The experimental class spent the entire school day in the experimental room where they were taught by different teachers in the various subjects.

In such a program we may legitimately look for improvement in (a) speech perception, (b) speech intelligibility, and (c) general educational achievement. These benefits may be measured by objective tests periodically administered during the experimental period. In this paper I shall confine my remarks to the achievements in speech perception of the profoundly deaf pupils in this class. Speech perception for the deaf child is understood to mean the process by which the physical characteristics of spoken speech, the visual and acoustic signals, are perceived as meaningful language symbols. For profoundly deaf pupils lipreading will be the primary avenue of speech perception, but hearing may play a part in the process provided that the sounds are sufficiently amplified to a level above the auditory threshold. A combination of lipreading and hearing, for the trained ear, should yield a higher speech perception score than either one alone even when the remnant of hearing is small. Improvement in speech perception, therefore, includes improvement in lipreading, in auditory perception, and in the combination of the two which I shall call "look-and-listen." The methods of testing for speech perception have been described in the two preceding papers and I shall not need to elaborate further on this aspect of the program.

It has long been understood by teachers of the deaf that partially deaf children respond readily to acoustic training. By partially deaf children I mean those whose hearing losses range from 60 to 75 db in the speech range. It is with those pupils whose hearing losses exceed this level and who have always been considered as profoundly deaf that this study has been mainly concerned. I can best illustrate the progress of speech perception in partially deaf pupils by showing articulation curves obtained from a partially deaf pupil which were obtained from tests administered at a two-year interval, (1948-1950). The upper set of curves in Figure 1 shows the speech perception data obtained from a partially deaf pupil (M. M.) who entered school in 1947 directly from a rural public school at the age of 11 years. This pupil has a hearing loss of 73 db in the speech range. The horizontal scale is a decibel scale, the "zero" of which is the threshold of hearing for speech sounds for this particular pupil. Word lists were read at

[1]Silverman, S. R., and Harrison, C. E. "The National Research Council Group Hearing Aid Project," *Amer. Ann. Deaf*, 1951, 96, 420-431.

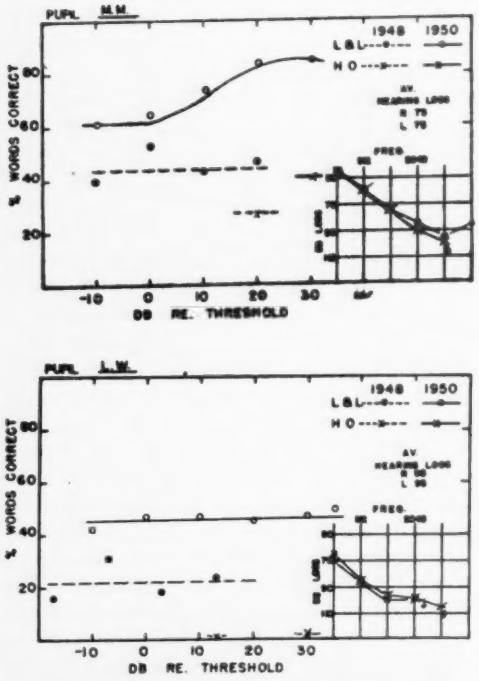


FIGURE 1—SPEECH PERCEPTION DATA OF TWO DEAF PUPILS NOT INCLUDED IN THE EXPERIMENTAL GROUP. THE PERCENT WORDS CORRECTLY UNDERSTOOD IS PLOTTED AGAINST THE INTENSITY OF SPEECH (IN DECIBELS) IN THE LISTENER'S EARPHONES. ZERO ON THE DB SCALE REPRESENTS THE THRESHOLD OF HEARING FOR SPEECH DETERMINED SEPARATELY FOR EACH PUPIL. AT LEVELS OF —10 AND 0 DB THE SPEECH IS INAUDIBLE, HENCE, SCORES AT THESE LEVELS REPRESENT THOSE FOR LIPREADING. THE EFFECTS OF ADDING HEARING TO LIPREADING APPEAR IN THE RISE OF THE CURVE AS THE INTENSITY IS INCREASED.

levels of 10 db below threshold, at threshold (0), and at 10, 20, and 30 db above threshold. The pupil looked at the speaker throughout the test. The scores, percent words understood, are represented on the vertical scale. The first two points on the curves beginning at the left represent pure lipreading since the words were read at levels either below or at threshold. The remaining points represent the number of words correct as amplification is increased up to 30 db above threshold, hence, these represent the effect of supplementing lipreading with hearing. It will be noted that in the tests of 1948 the addition of hearing to lipreading made no difference in the score. At the end of two years, however, the upper curve showed a rapid rise reaching a level of 82 percent which represents a gain of 20 percent speech perception over the pure lipreading score. The score for auditory perception alone is also shown on the graph. At the beginning the score was 30 percent. Two years later it was 40 percent. These data show what can be accomplished for a partially deaf pupil using group hearing aids under routine classroom procedures. In 1952 this same pupil showed further gains with scores of 77 and 96 percent for lipreading and look and listen respectively. The 1952 scores are not plotted on the graph.

Profoundly deaf pupils on the other hand may not be expected to respond as effectively to acoustic training. The lower set of curves in Figure 1 represents similar data obtained from a pupil in the same class as that of the one discussed above. With a hearing loss of 95 db this pupil could hardly be expected to respond perceptively to sound. It is to such pupils, however, that the research program is primarily directed in an effort to determine whether or not they should be considered as being beyond the reach of acoustic training. The curves for both the 1948 and the 1950 tests indicate no change in the level of speech perception as sound is added. The data are best fitted with horizontal lines although there is a decided gain in the general level of speech perception during the two years. By 1952, however, tests indicate that this pupil does respond to sound. The scores for lipreading and lipreading-plus-hearing are 53 and 59 percent respectively, a slight gain of 6 percentage points as a result of combining hearing and lipreading. The response to hearing alone is zero.

Now let us look at the results obtained from the experimental class. This group used the special hearing aid exclusively during a two-year period. The speech perception tests were administered at intervals during the period and scores were plotted in the same manner as those shown in Figure 1. Figure 2 shows the speech perception curves for the six profoundly deaf pupils in this group. They were all congenitally deaf or deafened before the age of two years with the exception of R. G. who became deaf at the age of 7 years following cerebral meningitis. The data represent speech perception at the beginning and at the end of the two-year

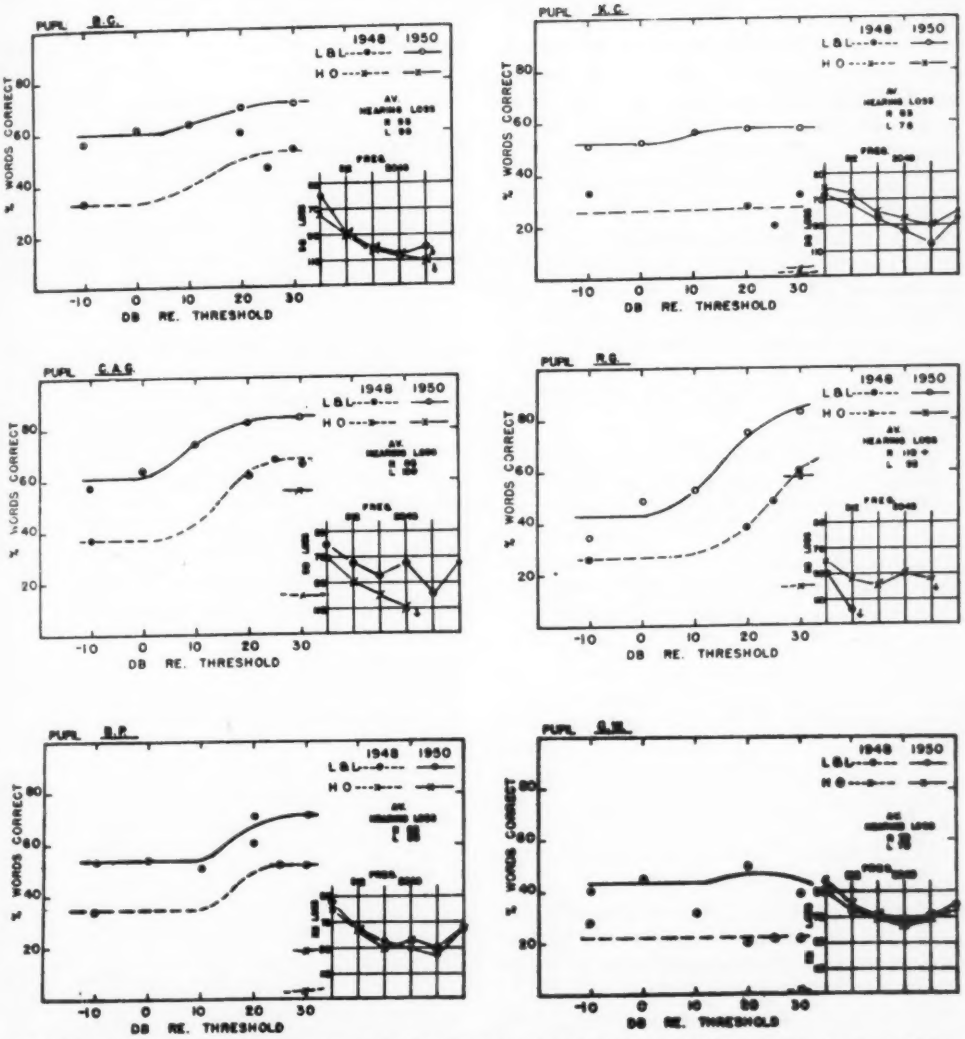


FIGURE 2—SPEECH PERCEPTION CURVES OF SIX PROFOUNDLY DEAF PUPILS. THE COORDINATES ARE THE SAME AS THOSE PRESENTED IN FIGURE 1. THE FIRST TWO POINTS ON THE LEFT OF EACH CURVE REPRESENT THE SCORES FOR LIPREADING. THE RISE IN THE CURVES THAT FOLLOW REPRESENTS THE EFFECT OF INCREASING THE SPEECH LEVEL IN STEPS OF 10 DECIBELS. THE TWO CURVES ON EACH PLOT REPRESENT THE SCORES AT TWO-YEAR INTERVALS. AUDIOGRAMS ARE SHOWN IN THE LOWER RIGHT CORNER OF EACH PLOT.

period. Each of the pupils with the exception of R. G. had used group hearing aids during the entire school day since they entered school four to six years before. This previous auditory experience is evident in most of the curves (broken lines) representing the test scores of 1948. With the exception of two pupils, K. C. and C. W., each pupil showed a higher speech perception score for look-and-listen than for lipreading alone. The 1950 scores (full lines) show further gains for all pupils in both lipreading and for lipreading and hearing combined following the experimental program. The differences between the pure lipreading scores and those of lipreading-plus-hearing range from 5 to 41 percentage points. These differences may be taken as a measure of the effectiveness of the ear in the speech perception process. The most spectacular difference is that of R. G. who, although severely deafened, was able to understand 83 percent of the words in test lists by eye and ear as com-

pared to 42 percent by lipreading alone. Obviously the auditory memory for speech resulting from the experience of having had normal hearing until he was seven years old plays an important role in the speech perception ability of this pupil.

Although the pupils in this study were able to employ the ear in combination with the eye in the understanding of speech to a considerable degree, only two of the group were able to use the ear alone to any effective degree. Pupils C. A. G. and R. G., who started the experiment with relatively low scores of 15 percent by ear alone, reached levels of 55 and 50 percent at the end of two years.

At the end of the two-year experimental period, this class moved to the grammar school where they continued their education in rooms equipped with modern hearing aids. Their progress has been observed during the past two years, and speech perception data are presented in Table 1 to show their present standing. The 1950 scores are shown for comparison. The group continued to make slight gains in both lipreading (LR) and look-and-listen (LL). Five of the six pupils wear individual hearing aids when not in the classroom and continue to supplement lipreading with hearing.

The evidence here presented suggests another very important fact with regard to acoustic training. It was formerly believed by a great many teachers of the deaf that acoustic training interfered with lipreading. The data are conclusive and indicate that the reverse is true. Each of the pupils made considerable gains in lipreading as well as lipreading and hearing combined. Those who made the greater gains in acoustic achievement also made the greater gains in lipreading.

It should be further noted that increased facility in speech perception is likely to effect general educational achievement. Evidence for this is shown by the fact that the experimental group discussed above made average gains of 1 grade a year during the two-year experimental period, while the averages for comparable classes were considerably less than 1 grade a year. Whether or not a full program of acoustic training will accelerate the educational process for deaf children generally is not yet certain. We may be reasonably certain, however, that the educational program will be enriched as the result of an improvement in communication skills as exemplified in improved speech perception.

TABLE 1

Speech perception scores of 6 profoundly deaf pupils for the years 1950, 1951, and 1952.

	1950		1951		1952	
	LR	LL	LR	LL	LR	LL
Pupils						
B. C.	59	70	56	74	65	63
K. C.	52	57	51	54	51	54
C. G.	61	84	56	81	68	88
R. G.	42	83	63	87	66	81
B. P.	54	71	61	78	74	70
C. W.	43	44	46	46	44	40

Discussion

QUESTION: I should like to know at what decibel loss in both ears you would advocate a child's admission to a deaf school.

DR. HUDGINS: Perhaps I could be very wrong on this, but I don't think that a hard of hearing child belongs in a school for the deaf. By that, I mean a child with a loss of less than 50 decibels, to 55. I think that 55 decibels would be a borderline for admission.

It is very difficult to draw a line and stick to it rigidly, and if someone else has an opinion on that, I would be glad to welcome it.

QUESTION: Are all of the tests spoken of on the program given in multiple choice forms?

DR. HUDGINS: No. The ones Miss Quick spoke of are on the choice forms. The ones we can use with older children are word lists. The pupil writes the words he hears on a blank form. This is a more difficult test, but we find that the children of the third or fourth grade level can write the words down.

Help Them to Hear

Hearing is the strongest incentive toward speech and language. It is the basis for the natural development of speech. . . . Teachers need not fear that lipreading will suffer. If the boy is encouraged to hear and watch speech always and if he receives adequate training in analysis of the movements which occur in speech, he will ultimately learn to use his ears and his eyes to the best advantage.

Irene R. Ewing.

MOLLY MATHER'S MAILBOX

HAPPY Nineteen-Fifty-Three, everybody, Democrats and Republicans, old people and young people, people with good ears and people without. It seems to me the outlook for 1953 is promising, in spite of the difficulties ahead. The U.S.A. accomplished a major political turnover without any dire calamity ensuing; and even the people who voted for Stevenson, of whom I was proudly one, are awaiting with interest and enthusiasm to see what Ike's next move will be. Whatever the election accomplished, it showed us that we were able to put two top notch contenders in the field to run for president, and if Ike ran far ahead of his party, why, the party will have time to catch up with him, let us hope, during the next four years, and it will be very interesting to watch.

In the December Mailbox an offer was made to open these columns to a discussion of the problems of age. This brought an immediate response, and the topic seems to be a good one with which to start the new year. Most of us do feel a little older as we throw away the 1952 calendar and hang up the calendar for 1953. As the Teacher Across the Hall, one of my favorite fellow contributors to the VOLTA REVIEW, once phrased it,

Hang the new calendar there by the window,
Take down the old one, the year has gone out.
Here are new days that we soon will be living,
Lovely new days we can wonder about.

That's the spirit, with which to face the new year, and also, I privately believe, to face old age. My remark that a discussion of "Constructive Approach to Later Maturity," in *Teachers College Record*, had depressed me brought a comeback from another of my favorite fellow contributors:

Is Growing Old Like Growing Deaf?

Dear Molly:

Why feel "depressed" about a discussion of advancing years, when you take everything else in your stride? I object to your choice of words, though certainly not to the basic arguments of the article which you quote.

To me, growing old has been something like losing my hearing, and carries some of the same pitfalls. When a man in the late sixties thumps his chest and declares he's as young as he ever was, I always am reminded of his friend who shouts, "Nothing to being deaf; you just don't have to listen to idle chatter." Both clichés are clearly defenses. In point of fact, we know that the sixties and seventies just plain slow us up. We don't walk as fast or as gracefully; we don't have as good figures or as much hair; don't eat with the same abandon, nor read without glasses. That's not fun, but it's there to take.

Like loss of hearing, birthdays creep up on us. Just when are we deaf? When people begin to mumble and it's their fault that we don't hear? Or is it when we buy our hearing aid and accept it? That's not fun, either. On what birthday do we cease to be young? I distinctly remember my four-year-old son coming in from play, crying because Alice, who could count farther than he could, said her mother was older than I. Of course, at his age, the older you are, the better. "Why, Mother," he said, "Alice says her mother is twenty-five? She'd be dead if she was that old, wouldn't she?" And I can see the corner in Akron, Ohio, where my older daughter turned to help me down the street car steps. I think I was thirty-three, but the sudden vision of advancing years loomed before me.

The article you quoted tells us we live longer than we used to do, and some of us must be problems, or *geriatrics* and *gerontology* would not be in the new dictionaries and social science would not assign experts to this field. Quite aside from all the medical, scientific, and social factors involved, my experience with my own age level is that no one of us can be either smug about our own solution or critical of the way some other person is balancing her seventies. I find it hard to hold my tongue when I hear that other cliché, "I want just to drop in my tracks!" Who doesn't? To have health, enough money to be independent, and to be spared loneliness are causes for thanksgiving, but give us no right to superiority. I know old people who have faced illness, dependence, and loss of family who still have much to give, and who do give, at cost to themselves. They leave me humble. But leaving these serious aspects of the old age problem, I have a few random observations.

Facing facts is an obligation laid upon us. Perhaps the time has come when we ought to give up our job, even if retirement requirements do not demand it. Perhaps everyone else knows we are not as efficient as we were, and covers for us, just as our families did before we took our loss of hearing as our own problem and did something about it. I have known, too, cases where the older person's insistence on living alone, far from being a help, rather added care to her children. I fear that to insist we can go on forever as we have always done, without changing our pattern, may be a sign, not of ability, but of obstinacy.

At the same time, I don't want anyone to keep telling me about Grandma Moses or Bernard Shaw to help me go on, any more than I wanted to have Beethoven and Edison constantly held up as examples when I first lost my hearing.

My point is, why be depressed about our birthdays, as if caught unawares? On the other hand, I do not believe we can prepare for old age in any specific sense, like learning to tat or keep bees.

I knew an old lady of ninety who, as a neighbor expressed it while walking home from a social gathering, "was the livest person there. She lighted up the room." But then, she always had. I suppose if we have learned that life means adjustment to circumstances and to other people, it makes us still that kind of person, even if we are hard of hearing or elderly. And that's a hard saying.

As for young people accepting us, the article "has something there." I notice that those of the younger generation who have been brought up with older people in the family know how to treat us as persons, not just old people for whom they must give up their easy chairs. Teaching children to be aware of others as persons, regardless of color, country, handicap, or age, is part of good breeding. However, we hold a good deal toward the solution of the problem, where it exists, in our own hands. The voice of experience sometimes carries with it unsolicited advice. I have never forgotten the comment of a son-in-law —not one of mine—when he said, "My mother-in-law is all right. She everlastingly minds her own business." That's another hard saying. Who can attain this ideal? Maybe it is like lipreading; we can keep working at it.

ALTHEA WOODRUFF
Palos Verdes Estates, California

Let's Take a Positive Viewpoint

It was not the discussion of advancing years, nor even the fact of advancing years, that depressed me; it was the attitude maintained in the course of the discussion; a negative rather than a positive attitude. And, while I subscribe wholeheartedly to much of what Mrs. Woodruff says, it seems to me that she too has emphasized the negative aspects of advancing age rather than the positive ones. And I think her comparison of age with deafness is full of holes.

Loss of hearing is definitely a calamity. It is a calamity for anybody; and while it is not by any means an insurmountable calamity, a whole lot of courage and optimism are required in order to get the better of it. Although I am frequently accused of being a starry-eyed idealist on this subject—goodness knows why—I am all with Mrs. Woodruff in loathing the person who shouts, "Nothing to being deaf; you just don't have to listen to idle chatter." It is true that the individual may, after long years of practice in dealing with the problems of deafness, gain in strength and vision, but it is at a heavy price. It does not seem to me that the approach to old age is at all the same thing.

We all know that age, like deafness, means relinquishment and renunciation; but age, if the individual has had even a fairly good and useful life, also means fulfillment, accomplishment, achievement, even a modicum of wisdom. The individual who has lived to be sixty without adding anything to his list of accomplishments and his scale of values is a poor individual indeed. It is a fact that I could not do today what I often did at twenty-two or three. Then, for instance, to outline a typical day about this time of the year, I could get through several hours of study and written work, several more hours of housework; then set off on snowshoes for a two hour tramp through the woods, coming home to dress for dinner, and, after dinner, deal with a mountainous stack of dishes; then go to a country dance and dance square dances vigorously till midnight. No, I probably could not do that even if I wanted to; but on the other hand, when I was twenty-two or three I could not possibly have done what I can do today: deal with a desk stacked higher with work than the kitchen sink was with dishes in the old days, take satisfaction (entirely without smugness, Althea) in dealing with a variety of problems—other people's problems, I hasten to add, not mine—and still have enough pep left in the evening to go to the Philharmonic Auditorium and watch the Bali dancers perform. At twenty I danced; now I watch others dance, but I still thoroughly enjoy dancing, and I have a far more interesting vista of dancers to look back upon and compare with the Balinese —Shankar, for instance, the great Hindu dancer; the Sadler's Wells Ballet, Pavlova, Fokina, Argentina, Argentinita, the Ballet Theatre, the Monte Carlo Ballet. Also, since I am dealing here with the primitive as well as the highly sophisticated, I could compare them with the great Indian dances of the Southwest—the Corn Dance, the Buffalo Dance, the Deer Dance, the Fire Dance of the Winter Solstice, or any of the Spring Dances to celebrate the earth's awakening. I had not seen any of those when I was twenty.

Why deal only with the negative aspects of age—the falling hair, the falling teeth,

(*See "Molly," page* 50)

I AM ONE OF THE LUCKY ONES

By PATRICIA STEWART

LIFE is good, nice, sometimes almost perfect. I can hear again! I know things are in a deplorable state. The world may end. All of us surely one day will be dead. But I am unreasonably happy. I can use either ear on the telephone!

I am one of the lucky ones on whom the fenestration operation for deaf ears worked—twice in the last four years. Right now I wouldn't trade my head for Queen Elizabeth's (with the diamond crown).

Five years ago I would have made the swap, though. I would have given mine away for nothing. I had my heart set on being a journalist and at that point I couldn't fulfill the first qualification of a reporter: listening accurately to other people. I couldn't even hear across the dinner table.

Two years earlier, when I was 25, I had been told by a prominent surgeon that I was headed for deafness. I was suffering from otosclerosis, the unwanted bone growth in the ears that causes most ordinary hard-of-hearing-ness. The progress of the disease may be slow or fast.

In my case the hearing deteriorated at a rapid clip that did justice to the way I was trying to move — around the world ahead of the affliction. Armed with a degree from Columbia School of Journalism and a lot of energy, I couldn't see wasting a minute of the interesting world, whether I could hear or not. The trip, of course, was wonderful in its way. But it was a journalistic flop. From Shanghai to London everyone spoke too softly for me to hear. Amsterdam and Paris are lovely to look at in the spring, but I'm afraid I'll never know how they sound. Germany was interesting, but what were all those people saying?

I bought a hearing aid and tried to use it. I had my hair re-styled to cover up the headband and referred to the mechanism, when I had to, as Earl, after the man who sold it to me. But besides making me feel all wired up like Dostoievsky's old Prince, Earl did me wrong in other ways. He would boom loudly at the beginning of a sentence and trail off just when the point was reached, then revive as the room was rocking with laughter. He sometimes rested for several days when I wanted him working. He made crotchety little noises of his own. He gave me headaches. On the other hand, to be perfectly fair, he let me in on innumerable conversations I would have missed altogether without him.

Even with Earl I began to feel miserably cut off from the interesting world and people around me. And what is there besides people for one who has devoted his soul from teen age on to the newspaper business? I was afraid I would have to stop trying to be a reporter. If I didn't, any prospective employers certainly would act in a negative way that would add up to the same thing.

In May, 1948, the doctor arranged for me to enter the hospital for my first try at fenestration—on my lesser (left) ear.

He told me that the otosclerosis which afflicted me is the most common form of deafness. It is believed to be hereditary and shows its most violent effects in the twenties. In its course bones grow over the little oval window, the fenestra, that separates the middle and inner ears.

In the fenestration operation, which has been regularly performed in the United States a little more than a decade, a surgeon with an extraordinarily delicate touch drills a new window into the external semicircular canal, part of the inner ear mechanism. The window is covered with a sheer fragment of tissue.

When the operation "works," the deaf person begins to hear again when the packing and bandages are removed from his aching head.

The percentage of failures in the operation, or chances of the window's closing up again, is small, but anyone who has this surgery must accept the fact that he is gambling with fate. The operation is not commonly done on the very young or the elderly.

It was a hot day in June 1948 when the doctor first took off my bandages and whispered in my ex-deaf ear. I heard him! I cannot possibly imagine a greater thrill. All the first day I lay in the hospital bed, straining, straining for sounds. Any rattle

or bang sounded enormous and wonderful.

The hearing fluctuates at first, and when it was down I was seized with a panic that the wonderful plan had failed. When it was good I wanted to hoard every minute.

Once out of the hospital, trying to regain my equilibrium, I discovered what beautiful music a trolley car makes, how lovely it is to hear a quarreling couple (behind you), how fine to understand a clerk talking over a counter.

The list stretches out forever. Every single sound is a blessing, a free gift straight from Heaven.

After six weeks under the surgeon's observation I was judged a "success" and sent home. In a few months my equilibrium was restored to the point where I could dance, even square dance; and as for dealing with people—well! No one ever had to shout. I cut my hair short and got rid of Earl!

The first fenestration operation gave me a new lease on life, a self respect that came from being able, finally, to hold up my end of human dealings. The second one (only a few months old now) promises to give me a new relationship with my infant daughter. She's babbling in her crib now, two rooms away, and I can hear her.

Shortly after her birth I began to hear much less well than I had at any time since the fenestration operation in 1948. Naturally I was seized with the old panic that the "window had closed up." Hearing tests disclosed this wasn't so. My right ear had rapidly deteriorated instead.

On the basis of my first success with fenestration I appealed to the doctor to repeat the performance for me. He agreed, telling me it is now believed that child-bearing hastens the progress of otosclerosis.

So in May 1952, for the second time, I took myself into the Baltimore heat and the maze of the Hopkins for an ear miracle.

After the bandages were off and the ache had left my head I began to hear again in the new ear—but not at the same time as in the old ear. When I complained of this to the doctor he said, "Now you can listen to two conversations at once!"

This zig-zag conversational effect finally ceased, and I had much less balance trouble than I had had at the time of the first operation. A loud noise could still send me reeling drunkenly across a pavement, and I felt weak with the effort of facing such a furiously noisy world. Newspapers rattled. Shoe heels clicked. People talked loudly. Phones jangled. Rain fell.

I began to get used to it, though. I love it! I fill my tub with bubble bath so I can hear the bubbles sizzle. I lie in bed and listen to the clock tick.

I wish that everyone who lives in the gray lonely world of the deaf could share my great thrill in these small things.

At 32 years of age I realize that if I had lived one lifetime earlier I would have had to spend my life being deaf.

I am happy to know that other Oregon youngsters, those growing up in the generation with my daughter, for instance, will not have to wait until they are 25 to learn that they have serious hearing impairment. Since 1937 the Oregon State Board of Health has conducted hearing surveys throughout the elementary schools of Oregon with the aim of hearing conservation. D. Wayne Smith, hearing consultant with the board, told me that the plan is to mass-test at least one third of all the schools in the state each year. Each school year, then, approximately 60,000 school children in the state are tested.

"We usually find approximately four percent of the children in need of medical observation," he said, comparing this with the national average of five percent. "In Oregon," he said, "this means that there is approximately one child in each school room with some degree of hearing impairment."

Within the four percent in need of medical observation are found all degrees of impaired hearing, ranging from the child who has a mild loss to the child who is handicapped in conversational speech. In my own county, Baker, Mr. Smith said that in 1951-52 audiometrists tested 1543 children, with 18 showing hearing loss. "We usually find the incidence less in the eastern part of the state, as do co-workers in the state of Washington," he said.

Since I had been told that the most ravaging effects of otosclerosis are felt in the twenties, I asked Mr. Smith how many Oregon children are found with critical hearing losses.

"Approximately three percent of those found with hearing loss have a 35 decibel

(*See "Lucky," page* 50)

IN THE BOOKS AND MAGAZINES

Health Resources in the United States, by George W. Bachman and Associates. The Brookings Institution, Washington, D. C., 1952. 344 pages. $5.00.

This is an excellent reference book, in which have been assembled facts and figures on the health resources available in the United States. An inventory of personnel and a list of objectives of existing programs are included, together with a résumé of the nation's health in the first half of this century.

The Measurement of Hearing, by Ira J. Hirsh, McGraw-Hill Book Company, Inc., New York, 1952, 364 pages. $6.00.

This extremely well written and well edited volume, presented from the point of view of the experimental psychologist, is intended both as a reference book for those engaged in the field of measuring hearing and as a textbook for those who are training for such clinical work, as well as for those in allied fields.

Dr. Hirsh, who is now affiliated with Central Institute for the Deaf and Washington University in St. Louis, was formerly a Research Fellow at the Psycho-Acoustic Laboratory of Harvard University, during which time much of this book was prepared. Prior to that he was on the staff of one of the Army's Aural Rehabilitation Centers.

One of the major purposes of the book is to relate the clinical and experimental aspects of hearing; hence, each chapter begins with experimental information and then proceeds to its clinical application. Chapter 1, entitled Sensation and Measurement, deals with psychophysics. In Chapter 2 the physical characteristics of the auditory stimulus and the basic principles of electricity are discussed. Chapter 3 is concerned with electroacoustic systems, the clinical application of the theory presented in the previous chapter. The next two chapters treat pure tone and speech measurements; Chapters 6 and 7, masking, fatigue, and differential sensitivity. Chapter 8 handles methods for measuring loudness and recruitment; Chapter 9, binaural hearing and bone conduction, a phase of work into which Dr. Hirsh himself, in other studies, has delved deeply. Chapter 10 deals with various types of conditioning in audiometry. The final chapter attempts to apply the experimental data discussed in the preceding ten in such a manner as to suggest some procedures for clinical audiometry.

Although the book does not treat the anatomy and physiology of the auditory mechanism, a knowledge of it is assumed, as are some concepts of college mathematics and statistics.

There have been a number of books relating to the hearing angle of the field of Audiology published in the past few years, which is in marked contrast to the paucity in that area prior to World War II. This volume might well be considered one of the most valuable, indeed an outstanding contribution to the literature. Even the most technical material in the book is written in an amazingly human style, with the use of the editorial "we" throughout. The book should prove to be a popular text with college students and a godsend to their instructors, particularly to those in the newly established Audiology Departments that are mushrooming throughout the country.

—SHIRLEY P. STEIN.

When Doctors are Patients, Edited by Max Penner, M. D. and Benjamin F. Miller, M. D. W. N. Norton Co., Inc., New York, 1952. 364 pages.

Here is a fascinating compilation of articles written by some thirty-three physicians about their own ailments, which cover a wide range, including deafness, blindness, heart disease, cancer, tuberculosis, and alcoholism, to mention only a few of the more common ones. Their analysis of their own physical and mental states during the period of their illnesses should make interesting and valuable reading for both professional and lay people. It seems to this reviewer, however, that the chapter on deafness leaves much to be desired.

Transactions, American Academy of Ophthalmology and Otolaryngology, January-February 1952, 100 First Ave. Bldg., Rochester, Minn.

Included in this issue are several articles relating to deafness and the educational and emotional problems related thereto. One by LeRoy D. Hedgecock is entitled, "Counselling the Parents of Acoustically Handicapped Children." Dr. James E. Landis is author of "A Report on the Hearing Survey in the Public Schools of Pennsylvania." "Audiology, Its Relation to Otology" is by Theodore E. Walsh, M. D., and "The Educational Philosophy of the John Tracy Clinic" is discussed by Mrs. Spencer Tracy. There is also included a brief discussion of Speech Audiometry by Dr. Gordon D. Hoople.

American Health Directory, by Henry Hatton, Public Affairs Press, Washington, D. C., 1952. 96 pages. $2.50.

This comprehensive guide to sources of information and aid in medicine, health, and related fields lists the name and address of virtually every agency of importance, nationally and internationally. Also listed are the publications issued by the various agencies. The subjects are cross-referenced, which facilitates the directory's use.

Meniere's Disease: Emotional factors can cause Meniere's disease, marked by dizziness, nausea, ringing of the ears and hearing loss in at least one ear, Drs. Edmund P. Fowler, Jr., and Adolf Zeckel of New York City write in the *Journal of the American Medical Association.* The troubles come from changes in the blood supply to the inner ear. Psychotherapy looks helpful, especially in early cases, they state.

(*See "Reviews," page* 50)

OUR MISCELLANY

Notes from the Summer Meeting

The attendance was well over 500; the actual registration 497. There were delegates from 37 states, the District of Columbia, and four provinces of Canada, as well as two visitors from Turkey and one from England.

* * *

Various groups held luncheon meetings during the convention—groups of alumni of the different teacher training centers. An especially enthusiastic luncheon of this kind was that of the Clarke School Teacher Education Alumni Association. This was held in the Yankee Room of the Hotel Northampton, with a representative group of 75 in attendance.

Mr. George T. Pratt, Principal of Clarke School, welcomed the group and acted as chairman. Officers were elected as follows: President, Vivian Tilly; Vice Presidents, Mary Frances Ragin, Barbara Rogers; Secretary-Treasurer, Margaret Kennedy; Executive Committee, Josephine Timberlake, Julia Ziskowski, Harriet Haskins, Mary Dunlap McCann.

* * *

Among the pleasant get-togethers arranged for the renewal of former social and professional interests was the luncheon of teachers who had taken their training at the Lexington School. This meeting was held in one of the private dining rooms of the Hotel Kenmore on June 19th and was attended by twenty-six persons including the present supervisory staff of the school.

Miss Groht and Miss New extended greetings on behalf of Dr. O'Connor and the school, and started off a session of general introductions and reminiscing. Everyone present gave a brief summary of her activities since completing training and several reported on the whereabouts of other alumnae unable to attend the luncheon. These reports aroused interest in those about whom no news was forthcoming and it was agreed that there should be a central organization through which Lexington-trained teachers might keep informed about one another and about general developments at Lexington.

Those present joined in establishing the Alumnae Association of the Lexington Teacher Training Department and asked the luncheon committee, consisting of Mrs. Margaret Wood, Miss Beatrice Ostern and Miss Grace Donnald, to act as a temporary steering committee. All one-time teachers-in-training at Lexington other than those attending the luncheon are asked to communicate with one of the above named at the Lexington School, as the committee is most anxious to have a complete record of names and current addresses of all alumnae.

* * *

Another of the special luncheons was that of the Gallaudet College Normal Training Department, which was held at the Hotel Kenmore in Boston. The tables were arranged in the form of a square and the graduates were pleased to have an opportunity to get together. No formal program was presented, but there was an interesting discussion centering about the past, present, and future of Gallaudet College. The hope was expressed that meetings of this sort can be a regular part of summer meetings of the Association.

* * *

The meeting of the National Council of Day School Teachers, scheduled as a part of the Boston program, had to be postponed because of the unavoidable absence of some of the key figures in the group. However, many members of the Council were present at the summer meeting and had opportunities to exchange greetings. Present officers of the Council are as follows: President, John F. Grace, Principal, Gallaudet Day School, St. Louis, Missouri; Vice-President, Nathan P. Harris, Principal Horace Mann School, Roxbury 19, Massachusetts; Secretary-Treasurer, Herman R. Goldberg, Director, Department of Special Education, Rochester, New York. Mr. Goldberg also edits the Newsletter published by the Council.

Harris Taylor Memorial: The death of Dr. Harris Taylor last July brought to a close the career of one of America's most distinguished educators of the deaf. His professional contributions were legion and are familiar to all who have worked with the deaf or read the literature of this field.

One of his deepest concerns for the welfare of the deaf was that of expanding teacher-preparation opportunity. In his lifetime he made an important contribution toward this expansion as Director of the Lexington School teacher-training program, and as adviser to New York University, Teachers College, and New York State on problems of deafness.

The Board of Trustees and the Teachers' Association of the Lexington School for the Deaf, realizing that Dr. Taylor's host of friends and co-workers may want to join in establishing a memorial to Dr. Taylor, have jointly endorsed the establishment of the Harris Taylor Teacher Training Loan Fund. Contributions to this fund will be disbursed as non-interest-bearing loans to those qualified young people who wish to complete the Lexington School-Teachers College teacher-training program and who need financial assistance beyond scholarships in order to complete the course. These loans may be repaid monthly after employment has been obtained.

Those who wish to join in creating this living Memorial to a great man and educator may make their checks payable to Harris Taylor Fund and send them to The Lexington School for the Deaf, 904 Lexington Avenue, New York 21, New York.

Gifts for Volta Bureau Service are acknowledged with sincere appreciation: Stahl Butler, Mrs. Irene J. Clarke, William A. Dougherty, Mary J. Harvey, Mary F. Hession, Hilleary F. Hoskinson, Mrs. Walter McAllister in memory of Alexander Nathanson, Mrs. Elizabeth H. Nitchie, Miss F. L. Willhoyt.

Class Teaches Youngsters to Hear

A LESSON IN HEARING

These five children combine listening with lip reading to learn how to speak. Miss Evelyn Marshall, speech therapist, is shown at right speaking into the microphone of the IDEAL Auditory Training Unit.

Covington, Kentucky, Course

For Nearly Deaf Children First in Northern Kentucky

A class to aid hard of hearing and deaf children—the first of its kind in a public school in Northern Kentucky—is rapidly invading the world of silence for these children. Organized early this year by Glenn O. Swing, Superintendent of Schools, the class is making excellent progress in auricular and academic training.

Miss Marshall uses records of sounds, sound effects, games, and toys in her teaching methods to make learning more interesting and less tedious for student and teacher. In addition to speechreading, and laboriously forming words or sounds they have been hearing only for a short time, the pupils learn writing, arithmetic, and other subjects so that they can progress at a rapid pace.

After penetrating the wall of silence with IDEAL Auditory Training Equipment, these children are no longer separated from the rest of us.

TEACHERS AND CHILDREN ENTHUSIASTIC!

In this and many other outstanding schools, universities, and clinics throughout the United States and many foreign countries, teachers report that the children are actually eager to listen on IDEAL Auditory Training Equipment. IDEAL is specifically designed for the needs of the acoustically handicapped—the sound is clear, crisp, brilliant and NATURAL. In fact otologists and teachers who hear it for the first time are amazed at its true outstanding quality. Even in those cases where children cannot tolerate sound with ordinary equipment they can and do listen for hours without fatigue on IDEAL. Naturally this speeds auricular and academic training.

IDEAL AUDITORY TRAINING EQUIPMENT

Quality that you can hear.

AVAILABLE IN NUMEROUS MODELS for the individual or any size group, to find residual hearing not revealed by any other means and train it rapidly.

Developed and Manufactured by

MELODY MASTER MANUFACTURING CO.

2106 BERWYN AVE. CHICAGO 25, ILLINOIS

Write for folder "Auditory Training Develops the Habit of Hearing"

A New Idea

Lipreading Textbook with *WORKBOOK!*

HEARING WITH OUR EYES

BY ENA G. MACNUTT
Hearing Counselor,
Public Schools of Newton, Massachusetts

A spiral-bound lipreading textbook and manual for teachers of the deaf or hard of hearing child, with accompanying workbook.

Now, for the first time, the pupil can use a workbook for lipreading just as he does for reading, spelling, and arithmetic.

Textbook-Manual $4.50 (plus 12c for mailing)
Accompanying Workbooks 35c each (plus postage)

THE VOLTA BUREAU
1537 35th Street, N.W.
Washington 7, D. C.

PARENTS LENDING LIBRARY

A Memorial to Clara Block

The following books are now in the Clara Block Lending Library and may be borrowed by members of the Volta Speech Association for the Deaf:

Baruch, Dorothy: New Ways in Discipline
Davis, Hallowell, M.D.: Hearing and Deafness, A Guide for Laymen
Ewing, Irene R. and Alex. W. G.: Opportunity and the Deaf Child
Keller, Helen: The Story of My Life (1903)
Lassman, Grace H.: Language for the Preschool Deaf Child
Montague, Margaret Prescott: Closed Doors
Myklebust, Helmer R.: Your Deaf Child, A Guide for Parents
Ronnei, Eleanor: Learning to Look and Listen
Ronnei, Eleanor and Porter, Max and Joan: Tim and His Hearing Aid
Samuelson, Estelle E. and Fabregas, Minnie B.: A Treasure Chest of Games for Lip Reading Teachers
Van Riper, C.: Speech Correction, Principles and Methods
Whitehurst, Mary Wood: Auditory Training for Children

In addition to the above books, important back numbers of *The Volta Review* and some bound volumes of past years, may also be borrowed.

VOLTA BUREAU
1537 35th Street, N. W.
Washington 7, D. C.

"Ewing House" in Australia is a new school established by the Victorian Committee for the Promotion of Oral Education for the Deaf. It is located in Ballarat, and was officially opened on August 22, 1952, by the Premier of Victoria, Mr. W. MacDonald. According to a letter written to the John Tracy Clinic by parents who have moved from a distant city to Ballarat so that their little boy might have the benefit of instruction at "Ewing House," the new building is now very well equipped with modern educational devices.

"Before the new building was completed," says the letter, "the staff struggled in an inconvenient hall behind a church. Their zeal overcame a great many discomforts. The staff consists of two teachers trained under Professor and Dr. Ewing in Manchester, England, and a third teacher from an ordinary school here. Another English teacher is to arrive shortly. A great advantage is the cooperation given by two Ballarat private schools who take any child for specified lessons or sport as soon as he is sufficiently good at lipreading to benefit. The intermingling with normal children seems to be of inestimable benefit to the deaf pupils.

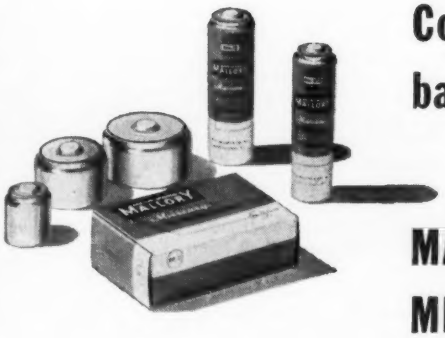
"We have been living in Melbourne for the past 18 months," the writer continues. "For nine of these months, Evan has been able to attend the preschool kindergarten at Burnwood, a suburb of Melbourne. There are 12 children there, of whom Evan is the youngest. The teacher, Mrs. Ward, was trained at the Central Institute, St. Louis, U. S. A.

"The lectures from the Tracy Clinic and the articles in the VOLTA REVIEW have shown what can be achieved with the correct education of deaf children. They have served as a guide for the future."

The Volta Review Is Appreciated by another parent overseas—this one in South Africa. Not having realized that the magazine was not to appear in July and August, she wrote as follows on October 9:

"I have been waiting from month to month, expecting copies of the VOLTA REVIEW every time overseas mail comes. Always, surface mail takes a long time, and sometimes a bit longer to get to the farm. But now I am getting alarmed because June is the last copy I have received. As I set great store by this precious magazine I do hope that you will see that my copies are dispatched. I am willing to pay for any which have been mislaid in the past for I cannot afford to miss any copy. My little boy is deaf and I am responsible for his education, and I find the magazine invaluable and feel the writers are old and dear friends."

Teachers who wish positions in day school work in New York will be interested in the announcement that examinations will be held for licenses as teacher of classes for the deaf and the hard of hearing in the near future. March 2, 1953, is the final date for filing applications. The written tests will be held on April 6, 1953, and applicants will be informed of the exact time and place. Salaries in these positions run from $3000 to $6300.



Count on longer, better battery performance . . .

MALLORY MERCURY "A" BATTERIES

Size for size Mallory Mercury Batteries give you longer, more satisfactory service than any other type battery.

Mallory Mercury Batteries last longer because there is no power-consuming chemical action except when your hearing aid is actually operating. And you enjoy freedom from fading because Mallory Batteries provide uniform power.

Why not try Mallory Mercury Batteries today? You'll find that longer service and better performance are just two of six reasons why they bring you more satisfying hearing aid performance.

NOW—THE NEW MALLORY RM-502
AA PENLIGHT SIZE MERCURY BATTERY

This new mercury-type battery now available for replacement in hearing aids designed for the AA Penlight Size Battery.

If you use this size, ask your dealer for the Mallory RM-502 today and see for yourself how much more service life and satisfaction you get from your hearing aid.

LOOK AT ALL THE OUTSTANDING FEATURES YOU ENJOY WITH MALLORY MERCURY BATTERIES

LONG LASTING . . . Size for size they give longer service than any other type battery.

FACTORY-FRESH . . . They do not deteriorate while in stock or when carried as spares . . . and *no* refrigeration is required.

NEED NO REST . . . Used intermittently or continuously, they give the same long service.

NO "FADING" . . . Fade-proof performance means less frequent volume adjustments. And tubes last longer.

NOISE-FREE CONTACT . . . Clean, quiet contact is certain because battery case design prevents leakage.

LOW COST . . . Extra long, dependable battery life means really low operating costs.

P. R. MALLORY & CO. Inc.

MALLORY

P. R. MALLORY & CO., Inc., BATTERY DIV., NORTH TARRYTOWN, N.Y.

THE NEW
Speechmaster

A new visual aid in the teaching of speech to the deaf. The child sees the positions of the tongue, operates the device and imitates the movements.

Further information will be gladly furnished upon request.

THE SPEECHMASTER COMPANY
69 North 9th Street, Newark 7, New Jersey

Hearing Rehabilitation Center
FOR CHILDREN AND ADULTS
Hearing Aid Consultation
Auditory Training **Lipreading**
EDNA K. MONSEES
1911 R Street, N. W., Washington 9, D. C.
DUpont 1700

MARY WOOD WHITEHURST
HEARING REHABILITATION CENTER
Lipreading **Auditory Training**
Hearing Aid Consultation **Speech Training**
Special Department for Children
330 East 63rd St. **New York 21, N. Y.**

LIPREADING SCHOOL OF CHICAGO
GERTRUDE TORREY
Room 1026, 220 South State Street
Phone, Harrison 7-1114 **CHICAGO 4, ILL.**

HEARING AID CONSULTATION
AURAL REHABILITATION
MARGUERITE V. EVERSDEN
1918 SPRUCE STREET
PHILADELPHIA 3, PENNA.
Consultation By Appointment **Phone: Kingsley 5-0499**

AUDITORY TRAINING FOR THE DEAF

By MARY WOOD WHITEHURST and EDNA K. MONSEES
$3
(Plus 12c for mailing)

THE VOLTA BUREAU
1537 35th Street, N. W.
Washington 7, D. C.

The Hard Way of the Transgressor was eased a bit by the St. Louis League for the Hard of Hearing when it received a most unusual appeal for help. The call came from a prisoner in the city workhouse, a young man of 29, serving a term as a first offender. He wrote, "I'm always in hot water because the guards and inmates here do not believe I'm hard of hearing. They think I purposely ignore them. I am desperately in need of help and don't know where else to turn."

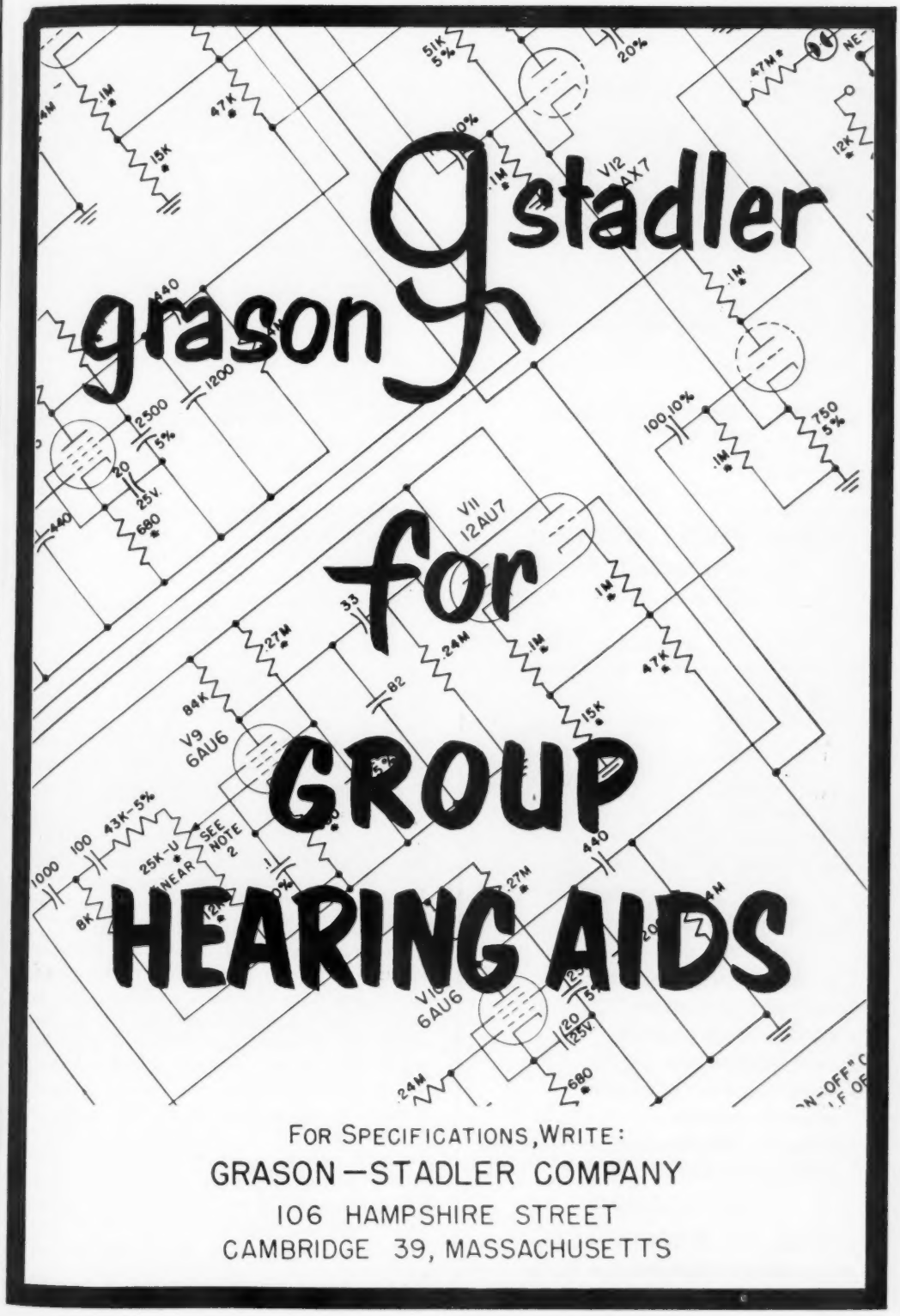
The League happened to have on hand a hearing aid of the same make as one formerly worn by the man—a second-hand instrument, given by a generous friend with the request, "Pass it along to someone who really needs it." There was a moving sincerity about this young prisoner's appeal, and the League was able to secure much cooperation in helping him. The cooperators included, first, the generous donor of the used hearing aid; next, the Bureau for Men; then a local hearing aid company; and finally, the prison warden. *League Life* tells the rest of the story:

"Through the Bureau for Men and the warden, arrangements were made to have the prisoner brought under guard to the offices of the hearing aid company. There his hearing was tested, the instrument checked and found to be of considerable benefit. An impression was taken for an earmold which was rushed through and mailed to him the next day. The League assumed the expense of the eartip, and the hearing aid dealer furnished a supply of batteries and a garment carrier. The young man was deeply grateful.

"It might be, in years to come when this particular hearing aid is consigned to the limbo of the hearing aid world, that it will take voice and boast to its contemporaries, much in the manner of an old man telling tales of his youth: 'Yes, fellows, I'm pretty much of a wreck now, but you should have seen me years ago! Even when I was well beyond my prime and long after my original master had discarded me, I found my way to the ears of a youthful transgressor who needed me far more than anyone had needed me before. And I have heard this young master say that I restored his faith in himself—and in humanity—and gave him encouragement and inspiration to start life anew."

An Experienced Teacher of hearing children, whose son has a severe hearing loss, found that he benefited so greatly last year from a summer on a farm, where he "learned words and language by doing," that she wonders "whether there might be other children with hearing limitations whose parents might want them to have this kind of experience."

The VOLTA REVIEW will gladly put any parent inquirers in touch with this teacher. She says: "I am free next summer. This lovely spot in Virginia, near Washington, is available to use as an outdoor laboratory for hard of hearing children. Here they can chop trees, build a tree house, feed chickens, observe insects, collect rocks, flowers, or leaves, pick beans, dig, or just watch the clouds. With direction, meaningful language could be developed painlessly. The cover charge would not be great—just enough to cover expenses, since I want no salary. My sister is a nurse and would volunteer her services too."



FOR SPECIFICATIONS, WRITE:

GRASON—STADLER COMPANY

106 HAMPSHIRE STREET

CAMBRIDGE 39, MASSACHUSETTS

"STORIES AND GAMES FOR EASY LIPREADING PRACTICE"

By

ROSE V. FEILBACH

$2.50

(Plus 12c for mailing)

100 delightful anecdotes and exercises

Order Now!

THE VOLTA BUREAU

1537 35th Street, N. W.

Washington 7, D. C.

AMBCO

HEARING AMPLIFIER

(Desk Type)

DESIGNED ESPECIALLY FOR CHILDREN

SOLD THROUGH SELECTED HEARING AID DEALERS

- **LIGHTWEIGHT, PORTABLE**
- **BATTERY OPERATED**
- **MORE POWER OUTPUT**
- **LESS DISTORTION**
- **TRUE DYNAMIC RECEIVER**
- **FLAT RESPONSE**
- **OVERALL DIMENSIONS, 3 x 4½ x 4¾**
- **A.M.A. ACCEPTANCE**

MANUFACTURED BY

A. M. BROOKS CO.

1222 W. WASHINGTON BLVD.

LOS ANGELES 7, CAL.

Reviews

(*From page* 43)

Language and Communication, by George A. Miller, McGraw-Hill Book Co., Inc., New York, 1951. 298 pages. $5.00.

Intended as a text in the psychology of communication, this book contains chapters devoted to certain aspects of speech. They deal with phonetics, perception of speech, verbal statistics, and rules for using symbols. The author, who for a time was affiliated with the Harvard University Psycho-Acoustic Laboratory, devotes some attention to the Bell Laboratories' visible speech.

Lucky

(*From page* 42)

loss or greater in the better ear," he reported. "If a child has a 25 decibel loss in the better ear, he may be certified for special education."

These youngsters, then, will not have the shock I had in discovering deafness. They will be adjusted to it, trained to live with it, be given a chance to focus on a career that fits their abilities.

Best of all, there is the promise of hope that deafness does not need to be forever.

Molly

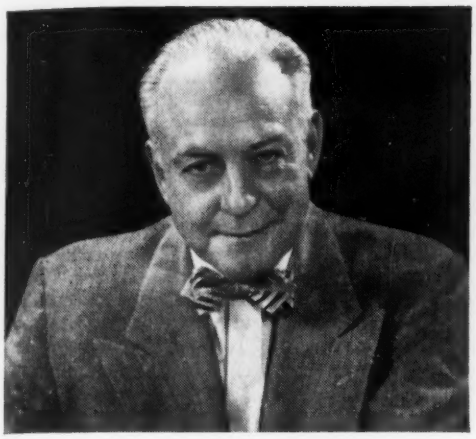
(*From page* 40)

the need for glasses? I once asked a wise woman of sixty, one of the teachers to whom I owe a great deal of what I know, if she minded growing old.

"No!" she answered emphatically. "Why should anyone mind growing old? As you grow older, you know so much more, you understand so much more, you have so much more in your life in every way."

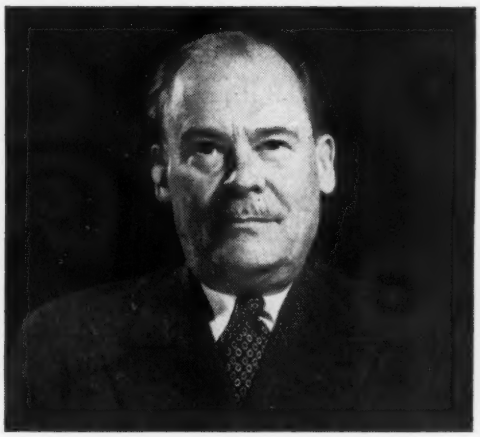
Of course, much of it is in the attitude of mind. I quote from a letter I received only a few days ago from a relative who is now in his seventies, and who, in all his utterances in recent years, has seemed to emphasize the negative aspects of growing old. It seems strange to me, because he had a vigorous and successful life; he built up a good and prosperous business in New York City by his own efforts; and he was able to retire with a competency, so he is not dependent. Moreover, he had hobbies and intellectual interests to which he turned after he sold his factory, and yet he writes:

I was glad to receive your recent letter, and thanks for remembering me. Nothing in particu-



JAMES HOWARD KINDELBERGER

Aviation executive of international renown; distinguished engineer and designer; chairman of the Board and chief executive officer of North American Aviation, Inc.; served as Air Officer, World War I; one of America's most expert and sought-after counselors in all phases of the aviation industry.



ERNST FREDERICK WERNER ALEXANDERSON

World-famous electrical engineer; one of America's outstanding inventors; has obtained more than 300 U. S. patents; recipient of international medals, awards, honors; noted pioneer in radio, television, electric ship propulsion, railroad electrification; consulting engineer for General Electric Company.

CHARLES EARL DAVY

Director of Engineering Operations and member of the Engineering Board of Chrysler Corporation; associated with advanced engineering designs and procurement of vital material; prominent in World War II aircraft and tank engine programs; identified with top industry projects for more than thirty years.

WILLIAM C. EDDY, CAPTAIN USN (RET.)

Famed pioneer in all branches of television engineering; holder of numerous audio-visual patents; instrumental in building the Navy's World War II radar training program; cartoonist and author; respected leader in research and development projects; President and active head of Television Associates, Inc.

These four great American engineering executives, who have a thorough understanding of electrical and mechanical devices, can afford any type of hearing aid at any price. They wear the seventy-five dollar Zenith hearing aid.

BIOGRAPHICAL DATA FROM FILES OF "WHO'S WHO IN AMERICA."

PEARL NECKLACE RECEIVER CORD
for fashion-minded women

- receiver cord entirely hidden from view regardless of the type of dress worn.
- receiver cord does not touch the body, which usually is annoying.
- HAL-HEN necklace receiver cords are also available in 13 different colors to match any ensemble. Earrings to match.

*See your local Hearing Aid Dealer and ask for a demonstration of the HAL-HEN necklace receiver cords. You will be delighted with the results.

HAL-HEN COMPANY
37-48 61st Street
Woodside 77, N. Y.

*Sold only through Hearing Aid Dealers. If your dealer does not carry the necklace receiver cord, kindly send in his name and address.

lar has happened to me, and I keep on wondering what life is all about. Millions are born every year, and millions die, in accordance with some plan of the Creator; but what is the plan? No one knows when his time to leave this world will come. I do not see much to live for, and will not mind going when the time comes.

It was a blessing that we had our five children, for where would I be today without them? There are five grandchildren, all boys. Two of them live with us, and they aggravate me a lot, because they are so heedless in thought and actions. There is always a difference of thought between the different generations, and it is only natural; a matter of life experience, as it were.

B. F., Massachusetts

This man, in spite of a lifetime of positive achievement in the business world, which included building up a large manufactory from scratch and making a considerable fortune from it, takes a very negative view of life as he nears its end.

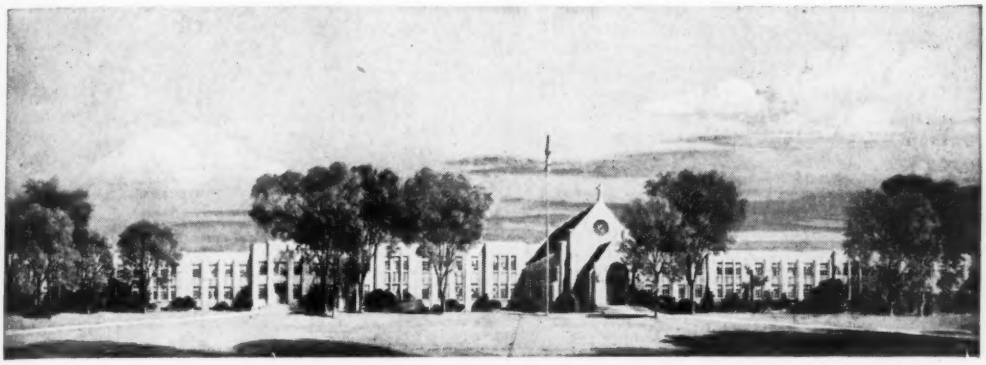
As I said, it is all in the attitude of mind, and I prefer the positive approach. I always liked what Charles Frohman said when he was going down on the *Lusitania* —or was it the *Titanic?*—"Why fear death? It is the greatest adventure life has to offer." It may be stretching things a bit to say old age is an adventure, but my sympathies are with the old people who, as Mrs. Woodruff says, make more trouble by insisting on living alone and looking after themselves. It is an adventure for them to see how well they can get along on their own, and I think they are entitled to it.

Face facts? Yes! I am all for calling a spade a spade, but I see no reason for calling all spades undertakers' implements because some of them happen to be used as such. Age brings deprivation, yes: but age is not all deprivation. The older person who has had a rich life can go on having an awfully good time with his own mind, just thinking about the things he knows and has read or seen or heard or plans to do or read or see tomorrow. It is the ability to think of tomorrow without dread that helps us to face old age. We don't have to be spry or beautiful or able to digest ice cream and hot dogs simultaneously. All we need, really, is to like people, to like life, to like our jobs, if we still have jobs, and to look forward without dismay, as we look backward without tears. At least that is the way I feel about it.

Sincerely yours,
MOLLY MATHER.

Lutheran Institute for the Deaf

Founded 1873



A PROTESTANT ORAL HOME-SCHOOL FOR DEAF AND HARD OF HEARING CHILDREN FROM THE AGE OF THREE—NURSERY THROUGH EIGHTH GRADE.

ALL BUILDINGS NEW, MODERN, AND FIREPROOF, HAVING BEAUTIFUL HOME-LIKE APPOINTMENTS.

Twenty-Acre Campus within the City of Detroit with Wooded Park and Ample Playground Facilities.

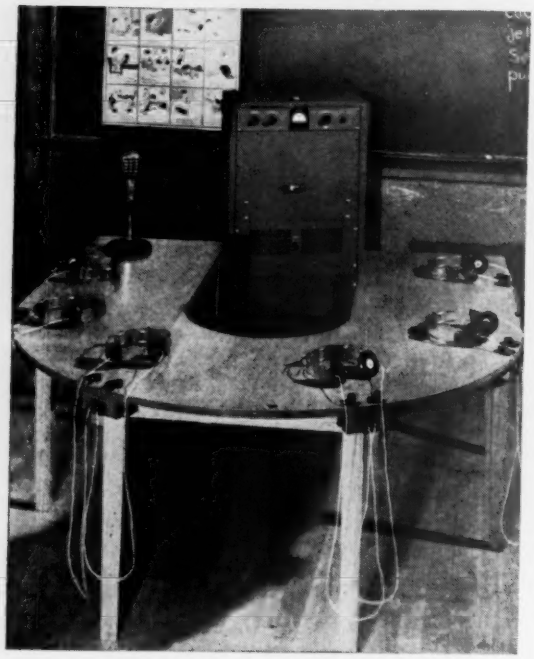
SMALL CLASSES — QUALIFIED TEACHERS — MODERN METHODS, CLASSROOMS and APPLIANCES. Individual and Group Hearing Aids, Visual Aids and Television.

HORSEBACK-RIDING, BICYCLING, TOBAGGANING, COMPETITIVE SPORTS WITH HEARING GROUPS, SCOUTING, and other recreational features.

Pupils enrolled from all parts of the U. S. and Canada. — NOT RESTRICTED TO LUTHERANS. — All parents desiring for their children a thorough elementary education together with Christian guidance in a home-like environment should write the Director for further information.

J. A. Klein, Director 6861 Nevada Ave. Detroit 34, Mich.

ORTHOVOX
Group Hearing Aid



Save Money—Modernize!

Yes, you'll be money ahead when you rehabilitate your old *Western Electric* group hearing aid with the advanced Orthovox System and the adoption of modern KENFRE headset equipment.

The combined use of the hearing aid receiver with group hearing aids is the most advanced step in years to improve this type of equipment.

We specialize in reconverting and bringing up-to-date your *Western Electric* group hearing aid at a cost much less than the cost of new equipment. Let us tell you how. Write today for full information.

High quality group training unit merchants since 1935
Write Kenfre Headset Co.
903 Maxwell Ave.
Grand Rapids 6, Mich.

AUDIPHONE Company
9 Ransom Ave., N.E., Grand Rapids 3, Mich.

Opportunities

(*From page* 19)

of tuition fees. Sponsored by Ohio Department of Health. Address W. Hayes Yeager, Chairman, Department of Speech, The Ohio State University, Columbus 10.

Quota Club of Columbus. Scholarship: $500; for graduate work for teacher qualifying to teach the deafened. Address Miss Jackson, 2094 Neil Avenue, Columbus.

PENNSYLVANIA

University of Pittsburgh. Graduate Assistantships: $1500 per academic year; possibility of renewal for summer months at approximately same rate; 15-18 hours per week of clinical services in Speech Clinic. Address Jack Matthews, Director, Speech Clinic, Division of Psychological Services, University of Pittsburgh, Pittsburgh 13.

Pennsylvania State College. Clinical Assistantships in Speech and Hearing Clinic: starting February or September; half-time; 20 hours per week; work primarily with adult vocational rehabilitation or college clients; $1120 for 10 months; remission of tuition; student expected to enroll for half-time graduate course load of 10 credits per semester. Address Eugene T. McDonald, Speech and Hearing Clinic, Sparks Building, Penn. State College, State College.

TEXAS

Texas Technological College. Eleven undergraduate scholarships for students of speech and speech correction. Address P. Merville Larson, Dept. of Speech, Texas Technological College, Lubbock.

University of Houston. Scholarships for teachers, administered by Houston Public School and by University of Houston, supported by Texas Society for Crippled Children: $60-$300. Address University of Houston, Houston.

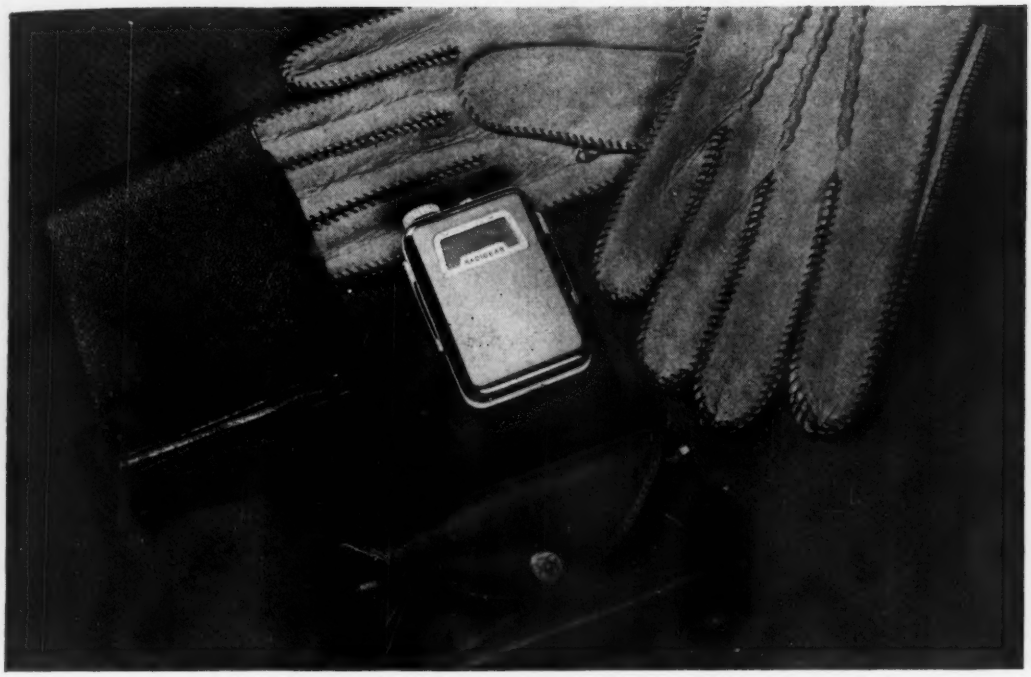
UTAH

University of Utah. Elizabeth H. Corey undergraduate scholarship: for student preparing to teach speech and correction of speech defects.

Junior Chamber of Commerce Auxiliary Incentive Scholarship: $100, for undergraduate study in field of hearing and speech disorders.

Address Dr. Wallace Goates, University of Utah, Salt Lake City.

HERE IT IS!



the extremely tiny hearing aid thousands have been waiting for . . .

RADIOEAR Model 82 "ZEPHYR"

The latest Radioear hearing engineering achievement . . . practical, extremely tiny, yet efficient, durable and **really** economical for every-day use. With "Zephyr," even the quite severely deafened can hear—and hear well. Special built-in feature—Radioear's famous patented Phone-master brings clear understanding over any phone, anywhere.

Ask your nearest Radioear Counselor about this amazing Model 82 "Zephyr". Write for FREE Folder on the "Zephyr" and other RADIOEAR Hearing aids.

RADIOEAR CORPORATION

RADIOEAR BUILDING • PITTSBURGH 16, PENNA.

Trustworthy Hearing Aids Since 1924

CENTRAL INSTITUTE
FOR THE DEAF

Founded by
Dr. Max A. Goldstein

ORAL SCHOOL for deaf children —Day and Residential—Preschool to High School—

SPEECH CORRECTION—Classes for Children with Aphasia and other defects of speech

Modern dormitories and equipment

INSTRUCTION and CLINICS for hearing assessment, deafness prevention, auditory training, lipreading, speech defects, including aphasia, cleft palate, laryngectomy, stuttering, articulatory defects, voice disorders—children and adults

TEACHERS COLLEGE—affiliated with Washington University—leads to B.S. and M.A. degrees and Ph.D. research degree—outstanding opportunities for practice.

MODERN LABORATORIES FOR RESEARCH IN SPEECH AND HEARING

S. Richard Silverman, Ph.D.,
Director

Helen S. Lane, Ph.D.,
Principal

For further information address the Principal

818 S. KINGSHIGHWAY
ST. LOUIS 10, MISSOURI

WEST VIRGINIA

West Virginia University. Assistantships: in Department of Speech; $600-$1000; graduate study toward M.A. Address Dr. J. H. Henning, Head, Department of Speech, W. Va. University, Morgantown.

WISCONSIN

University of Wisconsin. Graduate Research Fellowship in Experimental Audiology: Research in Galvanic Skin Response at Wisconsin General Hospital; requires M.A. in speech correction and experience in clinical audiology plus experimental psychology or physiology; work leads to doctorate; $1200 annual stipend. Address A. T. Weaver, Chairman, Department of Speech, or John V. Irwin, Director, Speech and Hearing Clinic, University of Wisconsin, Madison 6.

KENFIELD MEMORIAL SCHOLARSHIP.

Administered by American Hearing Society, 817 14th Street, N.W., Washington, D. C.: $100; available to any resident of the United States who desires to teach lipreading, but is not already teaching it; applicant must be college graduate.

Otologist

(*From page* 16)

dren to effective employment. A number of pupils, each year, are also prepared for admission to high schools for the normally hearing, and occasionally one goes to college.

Whether they are resident or day pupils, careful and continuous attention is given to their daily health needs. A medical staff of eight specialists stands ready to meet all medical problems. A close relationship is maintained by the pediatrician-in-charge with family physicians and with parents. Annually, complete physical examinations are given by the pediatrician, otologist, and ophthalmologist, and other tests are administered as the need arises. Medication as prescribed by the family physician is faithfully administered at the school under the direction of the school pediatrician.

Three nurses provide nursing care in the twenty-bed infirmary. The school dentist spends two days each week at the school, and examines each child at least

What makes sound movies so effective for teaching normal children?

SEEING plus HEARING!

The same principle makes CHROMOVOX such a dynamic medium for teaching the deaf and hard-of-hearing.

Chromovox is exceptionally easy to install and operate. Comes complete with microphone, 3 headsets and 3 basic tapes. 40 tapes in all are available. Also, blank tapes for teacher's original material.

Widely accepted in schools and clinics for the deaf and hard-of-hearing Chromovox works 4 ways to stimulate learning, motivate, develop and improve language.

1. **Captures the child's interest**—His eyes quickly focus on moving tapes with bold, black picture–phrase combinations.
2. **Holds attention**—Simultaneously, he hears the teacher speak the word or phrase through the high-fidelity compression audio system.
3. **Corrects mistakes**—When the child makes an error in breath, voiced or nasal sounds, the teacher flicks a switch lighting a color correction window.
4. **Increases teacher's effectiveness**—With Chromovox the teacher is released from the time-consuming chore of cutting, pasting, drawing, and lettering pictures and words. Chromovox offers some 40 tapes from the basic Babbling Reel to the advanced Baseball Reel.

Easy to operate, Chromovox is successfully used by both experienced and beginning teachers. By adding extension boxes, as many as 15 students can share in hearing participation—eliminating the need for any other audio system. Write for full information, prices and for details on FREE TRIAL OFFER. We will reply promptly.

CHROMOVOX DIVISION

Caledonia
Electronics & Transformer Corp.
Caledonia, N. Y.

once a year. Simple extractions and fillings are taken care of by him at the school on these days. Recommendations for more extended care and treatment are submitted to the parents for the attention of the family dentist.

One of the most important activities of the school is the program of parent education. Bi-weekly afternoon meetings and four evening meetings are held at the school. One large general meeting is held each year. At these meetings, members of the school staff acquaint the parents with the educational phases of the program. The parents are given advice on how to meet the social problems of the children in the home, and what educational activities to attempt in the home, supplementing the educational program offered at the school.

Members of the Medical Board also address the parents on the medical care program. Frequent demonstrations are given by teachers, illustrating educational activities. Through these frequent meetings, parents become thoroughly oriented to the problems of deafness, and the result is happier and more alert children, and more understanding parents, as well as pleasanter homes.

Religious instruction in all faiths is provided. An active extra-curricular program is also offered for the pupils. Clubs and hobby groups supply the very important asset of proper use of leisure time.

The school also provides a program for the training of teachers, which is affiliated with Teachers College, Columbia University. Occasionally, parents with the proper educational background are admitted to this program.

The school is under the direction of a self-perpetuating Board of Trustees. Similar schools exist in many other places, and every otologist should be prepared to inform parents about them.

References

The Educational Treatment of the Pre-School Deaf Child. V. Goodhill, *Laryngoscope*, Vol. 42, Aug. '47, P. 555.

What the Otologist Should Know About the Educational Problems of Deafness. Harriet Montague, *Laryngoscope*, Vol. 41, June '46, P. 305.

Prognosis in the Hard of Hearing Child. D. J. G. Wishart, *Laryngoscope*, Vol. 42, July '47, P. 444.

Testing Hearing of Young Children. E. Froeschels, *Archives of Otolaryngology*, Vol. 43, Feb. '46, P. 93.

REINHARDT SCHOOL FOR DEAF CHILDREN, INC.

Speech and Lipreading used exclusively. Children prepared for hearing schools. The school is in the suburbs of the city of Washington, which offers many educational advantages. Address:

MISS ANNA B. PECK, *Principal*
The Spruces Kensington, Maryland

WHAT PEOPLE SAY
THE NITCHIE SCHOOL BASIC COURSE IN LIPREADING
by Kathryn Alling Ordman and Mary Pauline Ralli
30 Complete Lessons $4.00 plus 25c postage.
Order from, and make checks payable to:
KATHRYN ALLING ORDMAN
24 Monroe Place Brooklyn 2, N. Y.

AUDITORY TRAINING FOR CHILDREN
A Manual for Parents and Teachers
By MARY WOOD WHITEHURST
Graded Lessons for the Deaf and Hard of Hearing Child
HEARING REHABILITATION CENTER
330 East 63rd Street New York 21, N. Y.
$4.00 plus 10c for mailing.

LANGUAGE STORIES and DRILLS
BOOKS I, II, III, and IV
by
Gertrude W. Croker, Mabel K. Jones and M. Evelyn Pratt
Illustrated by Tony Sarg
Price per copy $1.75
Teachers' Manuals I, II, III, and IV.
Price per copy 85c Postage not included.
Send orders to
CROKER, JONES & PRATT
13 Myrtle Street, Brattleboro, Vermont